

Exhibit G

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Amazon Kindle Fire In-App Purchase Usability Report

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Section 1: Introduction

This report presents the results of a usability test conducted to evaluate the user interface and workflow associated with Amazon Kindle Fire in-app purchases. Many applications (“apps”) available from the Amazon Appstore that run on the Kindle Fire offer the ability for in-app purchasing. In-app purchasing allows Amazon customers to buy add-on products within games and other apps. I understand that the Federal Trade Commission (FTC) has alleged that Amazon’s in-app billing practices constituted an unfair business practice under the FTC Act, contending that Amazon customers have incurred unauthorized in-app charges when a child is playing an app on a Kindle Fire tablet linked to the account holder’s Amazon account.

Specifically, I was asked to review the expert report of Jennifer King (October 16, 2015) and determine the validity of the conclusions reached in that report and, if appropriate, to prepare a rebuttal report. I was first contacted by counsel for Amazon after Ms. King published her expert report. Ms. King conducted a subjective, heuristic usability inspection of Amazon’s in-app purchase disclosures, purchase flow, and the process for customers to seek a refund. Ms. King’s opinions included her view that Amazon did not “effectively” convey to consumers “that children can incur in-app charges, that they can incur in-app charges without parental involvement, or that they would have to change their device settings in order to prevent children from incurring in-app charges without parental involvement.”¹

¹ Expert Report of Jennifer King (October 16, 2015) at 68.

1 In particular, Ms. King asserts that (1) “there is a lack of education material on the
2 tablet that defines what [in-app purchases] are”; (2) the “Key Details badge” contained on
3 the app-description page did not “effectively” convey to consumers “that children can
4 incur in-app charges, that they can incur in-app charges without parental involvement, or
5 that they would have to change their device settings to prevent children from incurring in-
6 app charges without parental involvement”; (3) the “Key Details badge” does not “work
7 together” with the in-app purchase notice and description contained on the app-
8 description page and “alone must effectively convey the presence of [in-app
9 purchasing]”; (4) the text of the Key Details overlay “contains no direct discussion” of
10 the “fact that [in-app purchases] have real costs associated with them that will result in
11 charges to the customer’s Amazon account”; (5) customers must already be familiar with
12 the term “in-app purchases” for the Key Details badge to have “any” impact; (6) the
13 language of the Key Details badge, the Key Details overlay, and the in-app purchase
14 notice are “unnecessarily vague”; (7) account holders would not understand that they can
15 activate Parental Controls to limit or prevent unauthorized in-app purchases made by
16 others who are using a tablet linked to owner’s Amazon account; (8) the term “Parental
17 Controls” ineffectively conveyed that account holders could restrict unauthorized
18 purchases; (9) the dialog box presented beginning in May 2013 for all first-time in-app
19 purchasers was ineffective for “many users”; (10) customers who read the May 2013
20 dialog box “may be confused” about its meaning; (11) the term “real money” was
21 confusing in the absence of a dollar amount or dollar sign; (12) customers may “assume”
22 that the May 2013 dialog box “is a routine security check rather than a financial
23 authorization”; (13) the text of the May 2013 dialog box is “not clear” and the term
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1 “future in-app purchases” is vague; and (14) Amazon did not effectively convey to
2 consumers how to contact Amazon to request a refund for an unauthorized in-app
3 purchase.

4
5 I designed a usability test to evaluate many of Ms. King’s subjective opinions and to
6 assess whether Amazon Kindle Fire tablet interfaces, notifications, and descriptions
7 associated with in-app purchases were so far below contemporary, accepted business
8 practices that they would have unfairly confused parents and resulted in significant
9 numbers of unwanted and non-refunded in-app purchases. In short, my usability test,
10 designed according to accepted standards, would either corroborate or invalidate Ms.
11 King’s conclusions. This test was designed and performed to evaluate and assess how
12 clearly the current (and prior) user interfaces communicate the availability and nature of
13 in-app purchasing, the availability and purpose of Parental Controls as a means to restrict
14 in-app purchasing, and the availability of contacting Amazon to request refunds for
15 allegedly unauthorized purchases. The test also evaluates customers’ ability to contact
16 Amazon to request a refund in the event of an unwanted purchase.

17
18
19 Contrary to Ms. King’s subjective opinions, the results of the usability test indicate
20 that the availability and nature of in-app purchases was very clearly communicated to and
21 understood by Kindle Fire users. Subjects reported and demonstrated very little confusion
22 regarding the information that was provided to them on the Kindle Fire interfaces during
23 the in-app purchase process. Subjects well understood the description pages of apps that
24 supported in-app purchases as well as those that did not. Subjects well understood the
25 difference between incurring a cost to download an application and incurring a cost
26 associated with an in-app purchase. Subjects well understood confirmation screens that
27

1 asked users to enter a password to approve an in-app purchase. Subjects well understood
2 the purpose of Parental Controls as it relates to preventing future in-app purchases.
3 Lastly, subjects well understood the content of the email receipt that is emailed to every
4 account holder when an in-app purchase is made and all subjects demonstrated various
5 successful ways that they could contact Amazon if they desired a refund.
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1.1 Educational and Professional Background and Qualifications

I hold a Bachelor in Science in Industrial Engineering, a Masters in Science and a Ph.D. in Human Factors from the University of Washington School of Engineering. For over 25 years I have worked in the areas of human factors, user interface design, software development, software architecture, systems engineering, and modeling and simulation across a wide variety of application areas including aerospace, communications, entertainment, and healthcare.

For the past 18 years, I have served as a consultant for Global Technica, Sunny Day Software, Stanley Associates, Techrizon, CDI Corporation, and the Barr Group. In this capacity I have provided advanced engineering services for many companies.

I consulted for the Boeing Company for over 16 years as a senior human factors engineer, user interface designer, and software architect for a wide range of advanced commercial and military programs. Many of the projects that I have been involved with include advanced software development, user interface design, agent-based software, and modeling and simulations in the areas of missile defense, homeland security, battle command management, networking and communications, air traffic control, location-based services, and Unmanned Aerial Vehicle (“UAV”) command and control.

Additionally, I was the lead system architect developing advanced air traffic controller workstations and air traffic control analysis applications, toolsets, and trade study simulations for Boeing Air Traffic Management.

1 I was also the architect of the Boeing Human Agent Model, which is an advanced
2 model for the simulation of human sensory, cognitive, and motor performance as applied
3 to the roles of air traffic controllers, pilots, and UAV operators. In another project, I was
4 the lead human factors engineer and user interface designer for Boeing's main vector and
5 raster computer aided drafting and editing system that produces the maintenance
6 manuals, shop floor illustrations, and service bulletins for Boeing Commercial Aircraft
7 Company. Additional responsibilities in my time as a consultant include system
8 engineering, requirements analysis, functional specification, use case development, user
9 stories, application prototyping, modeling and simulation, object oriented software
10 architecture, graphical user interface analysis and design, as well as UML, C++, C#, and
11 Java software development.
12

13
14 In 1995 and 1996, I was hired as the lead human factors engineer and user interface
15 designer for the first two-way pager produced by AT&T. Prior to this technology, people
16 could receive pages but had no way to respond utilizing their pager. This new technology
17 allowed users to use a small handheld device to receive and send canned or custom pages,
18 access and update an address book, and access and update a personal calendar. This high
19 profile project involved designing the entire feature set, user interface/user interaction
20 design and specification, as well as all graphical design and graphical design standards.
21

22
23 From 1999 to 2001, I was the lead human factors engineer and user interface designer
24 for Eyematic Interfaces, which was responsible for all user interface design and
25 development activities associated with real-time mobile hand held 3D facial tracking,
26 animation, avatar creation and editing software for a product for Mattel. My work
27

1 involved user interface design, human factors analysis, requirements gathering and
2 analysis, and functional specifications.

3
4 I was the lead user interface designer for a company called ObjectSpeed that
5 developed a portable handheld device for use in homes and businesses that had the many
6 of the same capabilities that we take for granted in mobile cellular phones. This portable
7 multifunction device supported email, chat, video conferencing, internet radio, streaming
8 media, Microsoft Outlook integration, photo taking and sharing, etc. The ObjectSpeed
9 device was specifically designed and developed as a portable handheld device.

10
11 I am the founder, inventor, user interface designer, and software architect of
12 WhereWuz. WhereWuz is a company that produces advanced mobile software running
13 on GPS-enabled smartphones and handheld devices. WhereWuz allows users to record
14 exactly where they have been and query this data in unique ways for subsequent retrieval
15 based on time or location. WhereWuz was specifically designed and developed to run on
16 small handheld devices.

17
18 I am the co-founder of a medical technology company called Healium. Healium is
19 developing advanced wearable and handheld user interface technology to allow
20 physicians to more effectively interact with electronic medical records. I am also the co-
21 founder of a medical technology company called StratoScientific. StratoScientific is
22 developing a handheld smartphone stethoscope that turns a handheld computer such as a
23 smartphone, PDA, laptop, or tablet into a full featured digital stethoscope.

24
25
26 I designed and developed a large software project for Disney World called xGS that
27 allowed the operational employees of Disney World to utilize a handheld device to view

1 the status of all of the guests within multiple attractions as well as within one of their
2 restaurants. The application could run in a real-time/live mode where it would display
3 data collected from sensors that showed the location and status of all guests within the
4 attraction; the application could also be run in a fast-time/simulated mode. The
5 application was developed on a laptop computer and was specifically designed to run on
6 a variety of handheld devices including laptops, PCs, smartphones, and tablets.
7

8 I have received numerous awards for my engineering work relating to interface
9 design, computer graphics, and the design of spatial, stereographic, and auditory displays,
10 including a \$10,000 scholarship from the I/SEC for advancing the field of interactive
11 computer graphics for flight simulation, a Link Foundation award for furthering the field
12 of flight simulation and virtual interface design. I have created graphics for several
13 popular book covers as well as animations for a movie produced by MIRAMAR. I have
14 published twenty-two research papers in professional journals and proceedings relating to
15 user interface design, computer graphics, and the design of spatial, stereographic, and
16 auditory displays.
17
18

19 I graduated from the University of Washington in 1988 with a B.S. in Industrial
20 Engineering. After graduation, I continued my studies at the University of Washington.
21 In 1990, I obtained an M.S. in Human Factors. In 1994, I graduated with a Ph.D. in
22 Human Factors. In the course of my doctoral studies, I worked as an Associate Assistant
23 Human Factors Professor at the University of Washington Industrial Engineering
24 Department. My duties included teaching, writing research proposals, designing and
25 conducting funded human factors experiments for the National Science Foundation, as
26 well as hiring and supervising graduate students.
27

1 While studying at the University of Washington, I also worked as a human factors
2 researcher and designed and performed advanced human factors experiments relating to
3 interface design, stereoscopic displays, and advanced visualization research, which was
4 funded by the National Science Foundation. My duties included user interface design,
5 systems design, software development, graphics programming, experimental design, as
6 well as hardware and software interfacing.
7

8 Attorneys for Amazon.com first contacted and retained me for purposes of this report
9 on October 20, 2015.
10

11 I am being compensated for my work on this matter and my fee is not contingent on
12 the outcome of this case or on any of my opinions or the technical positions I explain in
13 this report. My rate of compensation is \$500 per hour, and the rate for the two individuals
14 assisting me is \$250 per hour.
15

16 In the last four years, I have testified as an expert at trial or by deposition in the
17 following cases:
18

- 19 • *Silver State Intellectual Technologies v. Foursquare*, IPR2014-00159 (deposition)
- 20 • *Silver State Intellectual Technologies v. Garmin*, District of Nevada, 2:11-cv-
21 01578-PMP-PAL (deposition and trial testimony)
- 22 • *Select Retrieval v. Overstock*, District of Delaware No. 1:11-cv-00812-RGA
23 (deposition)
- 24 • *Location Labs v. Locatio.net*, IPR2014-00199 (deposition)
- 25 • *Intellectual Ventures v. Google*, IPR2014-00787 (deposition)
- 26
- 27

1 A detailed record of my professional qualifications, including a list of publications,
2 awards, research grants, and professional activities, is set forth in my curriculum vitae
3 that is attached to this report as Appendix H.
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Section 2: Experiment Methodology

A usability test was performed to evaluate what is understood by people using Amazon Kindle Fire tablet interfaces, notifications, and descriptions that are associated with in-app purchasing. This test was carefully designed for neutrality to accurately determine what subjects noticed and understood regarding the various interfaces related to in-app purchases. Furthermore, the test was designed so that it would identify whether any of the tested interfaces, notifications, descriptions, and refund protocols associated with in-app purchasing were so far below contemporary, accepted business practices that they would have unfairly confused parents and resulted in significant numbers of unwanted and non-refunded in-app purchases.

2.1 Test Subjects

This usability test included 24 subjects (8 experienced Kindle Fire users and 16 inexperienced Kindle Fire users). There were a total of 28 people recruited for the study; however, three did not appear and one untimely canceled. All of the subjects were previously unknown to the researchers and were recruited using a craigslist post that advertised the study as a mobile tablet study for parents or grandparents. The inclusion criteria were that all subjects must be over the age of 20 years, comfortable using a tablet or smartphone, have at least one child or grandchild currently aged 13 or younger, and be fluent in English. The subjects did not know anything about the purpose of the study until the study was complete.

1 A copy of the craigslist post and recruitment screening survey is provided in
2 Appendices A and B respectively. There were two copies of the craigslist post, one in the
3 “Community” section November 20-24, 2015, and the second in the “Gigs” section
4 November 21-24, 2015. Test subjects were each compensated \$150 for their time.
5

6 Use of 24 subjects is consistent with the practice in the discipline, as is evident when
7 considering similar studies published in books, peer reviewed journals, and proceedings.
8 For example, a usability study by Page (2014) to evaluate the adoption of touchscreen
9 mobile devices by older adults used four subjects. Werner, Werner, and Oberzaucher
10 (2012) evaluated general usability of iPad tablets in a study with 11 adults over the age of
11 60 years old. Another study used 12 subjects to analyze user experience between apps
12 delivered on a mobile smartphone versus a PC desktop (Ryan & Gonsalves, 2005).
13 Madithil, Koikkara, Gramopadhye, and Greenstein (2011) utilized 15 subjects to study
14 the usability of consenting systems on touchscreen interfaces, including tablets. Several
15 studies have tested the general usability and performance of e-book readers and used 10
16 subjects (Siegenthaler, Wurtz, & Groner, 2010), 20 subjects (Pattueli & Rabina, 2010),
17 and 33 subjects (Bigson & Gibb, 2011). Similarly, (Siegenthaler, Schmid, Wyss, & Wurt,
18 2012) used 12 subjects to analyze reading behavior between LCD and e-ink tablets.
19
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22
23

24 **2.2 Location and Equipment**

25 The experiment was performed at the Human Factors and Statistical Modeling Lab at
26 the Seattle Campus of the University of Washington.
27

1 Each subject was provided a Kindle Fire HD 6 tablet, a Windows laptop computer,
2 and standard telephone for use during the test. The Kindle Fire and laptop computer were
3 both connected to the Internet and the telephone was fully operational. They were also
4 provided the username and password for an active Amazon account.
5

6 Subjects completed an online survey using the laptop as they performed each task.
7 The survey was created using Adobe Captivate 9 and the results were tracked using a
8 learning management system provided by Knowledge Anywhere. The survey displayed
9 one question at a time to each subject. In this way subsequent questions would not be
10 able to influence the answers to previous questions. For the questions that required
11 interpreting information presented on the Kindle Fire HD tablet, the survey provided a
12 small thumbnail image to the user so that the user could be sure they were viewing the
13 correct stimulus on the Kindle Fire display. Figure 1 shows a typical survey screen and
14 screenshots for all screens are shown in Appendix G of this report.
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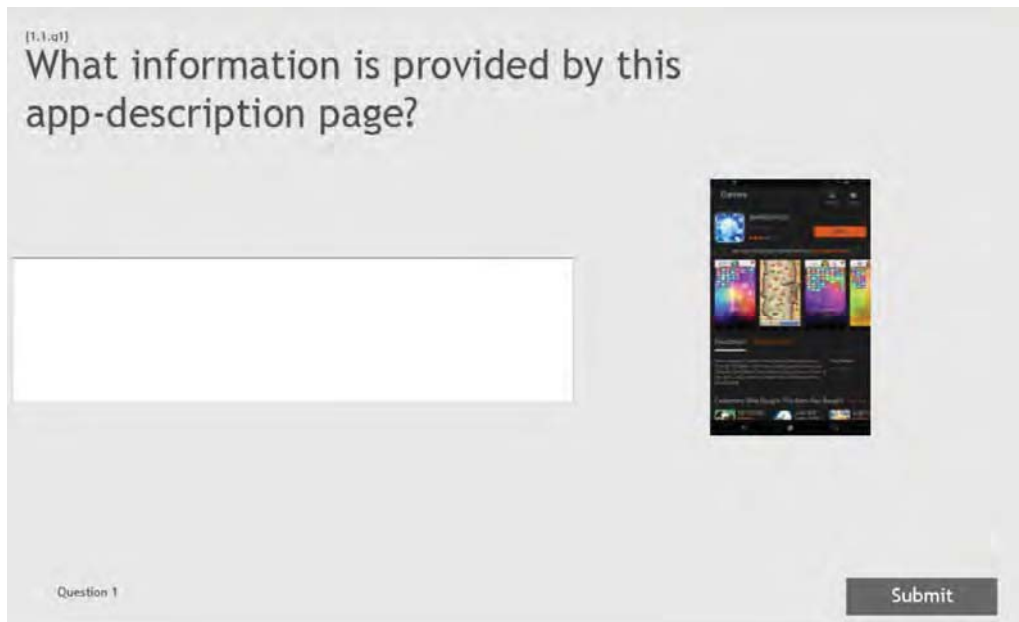


Figure 1. Typical survey screen

2.3 Procedure

Prior to running the test with live subjects, the experimental team performed three dry runs with test subjects. In addition, the study facilitator performed numerous dry runs with no subjects in order to perfect the delivery of the experiment.

All study sessions were led by the same facilitator, Erika Miller, who has experience running hundreds of subjects through studies in a similar capacity. For some sessions a second facilitator participated as well.

The facilitator(s) led the subjects through the study, using a PowerPoint presentation (see Appendix E) containing screenshots guiding the subjects through all of the tasks. When content was presented on the Kindle Fire tablets, the facilitator(s) also observed each subject to ensure they were viewing the correct content associated with the relevant

1 question. The study included numerous stop points where activity ceased until all
2 subjects had reached the same point.

3
4 To ensure consistency for all subjects, the instructions provided to the subjects were
5 read by the facilitator(s) from a script, included in Appendix D of this report.

7 **2.4 Tasks**

8 The study design included four different tasks:

- 9
10 • Task 0 was a simple demographic survey that collected information about the
11 subjects, such as their gender, age, education, occupation, experience with Kindle
12 Fires, smartphones, and age of children or grandchildren.
- 13
14 • Task 1 related to the description of an app that is provided to a user before the
15 user purchases that app. If the app offers in-app purchasing, information relating
16 to in-app purchasing is also provided as part of this description.
- 17
18 • Task 2 related to the confirmation dialog box presented to users when they try to
19 make their first an in-app purchase (testing both a version first implemented by
20 Amazon in May 2013 and a revised version implemented in June 2014). This
21 confirmation dialog box includes a request for an account password and provides
22 information about and the option to set Parental Controls to require a password
23 for future in-app purchases.
- 24
25 • Task 3 related to the emailed order confirmation that is sent to Amazon account
26 holders immediately after completion of an in-app purchase, as well as the various
27 methods account holders use to contact Amazon to request a refund, if desired.

1 The stimuli for Task 1 and Task 2 were presented on the Kindle Fire. Task 3 was
2 presented on a computer, as that would be a typical way to view and react to an email,
3 particularly if the email arrived while a child or grandchild was using the Kindle Fire.
4

5 Some Task 2 activities were based on an older version of the user interface. Since
6 these screens are no longer available live on a Kindle Fire, subjects were shown
7 screenshots. The Kindle Fire was used to display all screenshots that relate to interfaces
8 that would be viewed on a Kindle Fire to ensure that the display was properly replicating
9 the interface (e.g., size, location, resolution, brightness) that a Kindle Fire user would
10 experience. A series of full-size screenshots were saved in the photo viewer on each
11 Kindle Fire, and the test facilitator loaded the appropriate image onto the tablet as needed
12 to accomplish each task.
13

14 Appendix F shows the task flow for each of the four tasks that were used in the study.
15
16

17 **2.4.1 Task 0: Demographic Survey**

18 A demographic survey was given at the outset to gather general information about
19 each user (for example, gender, age, education, occupation, and age of children or
20 grandchildren) and the users' experience with smart devices such as smartphones and
21 tablets.
22

23 **2.4.2 Task 1: App Description Page**

24 Task 1 evaluated subjects' understanding of the information provided on the app-
25 description page that Amazon customers see when selecting apps from the Amazon
26
27

1 Appstore. This task evaluated two types of apps: apps that are free to download and
2 (1) provide opportunities for in-app purchases and (2) do not provide opportunities for in-
3 app purchases. The app “Jump Racer” was used to represent apps with opportunities for
4 in-app purchases (see Figure 2). The app “Jeweled Bricks” was used to represent apps
5 without opportunities for in-app purchases (see Figure 3).
6

7 Amazon Underground launched after the relevant time period and began labeling
8 apps as “Actually Free” in the description page. Therefore, only apps that did not include
9 this “Actually Free” reference were used in the study. Furthermore, for both types of apps
10 (with and without opportunities for in-app purchases), only apps with app-description
11 pages that included “Key Details” badging were presented to the subjects. Also, the
12 application that had the opportunity for in-app purchases (“Jump Racer”) included the “+
13 Read More” feature, which when clicked would show the balance of the app-description,
14 including the text description for in-app purchases and Parental Controls.
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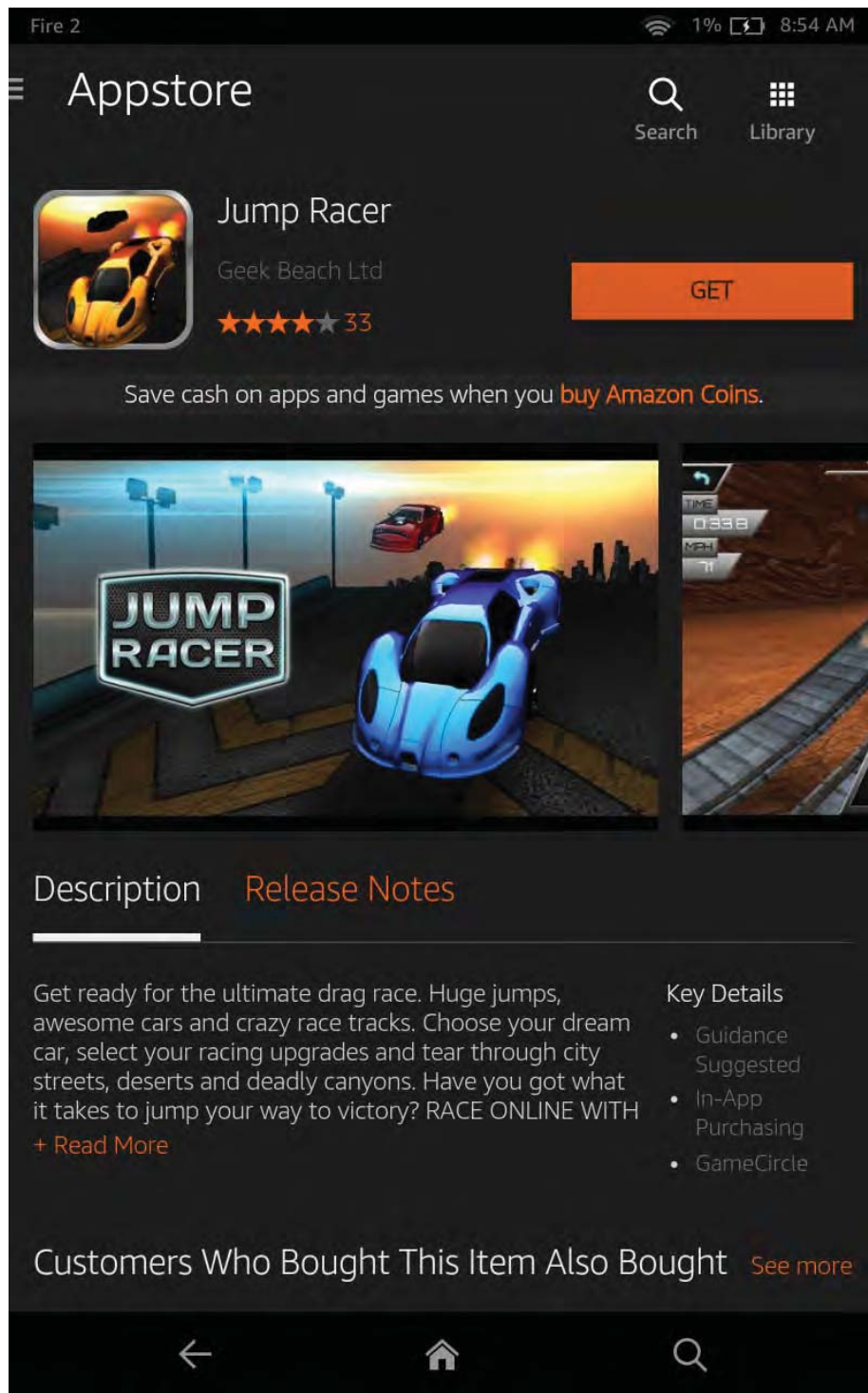


Figure 2. “Jump Racer” app-description page (in-app purchasing)

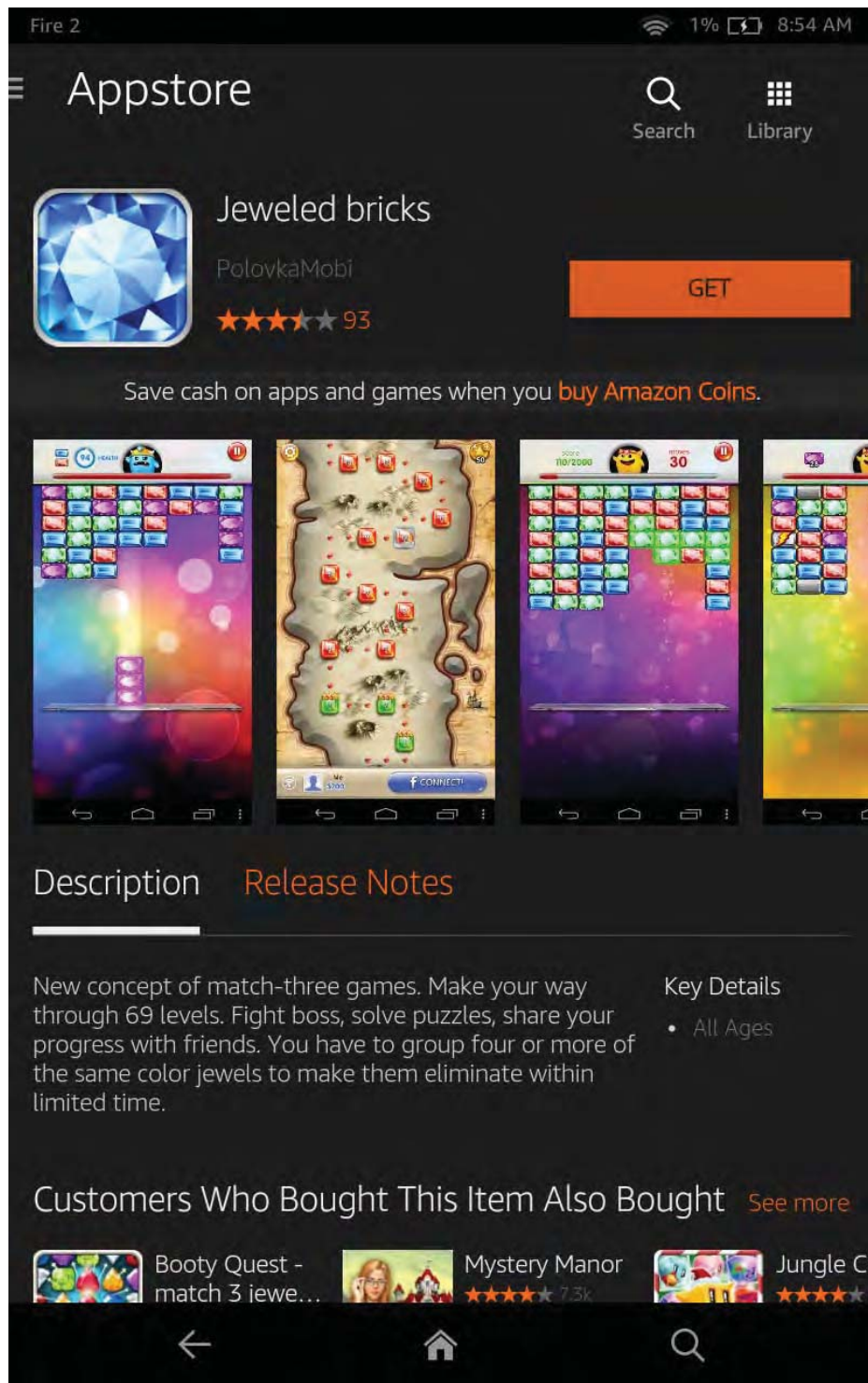


Figure 3. “Jeweled Bricks” app-description page (no in-app purchasing)

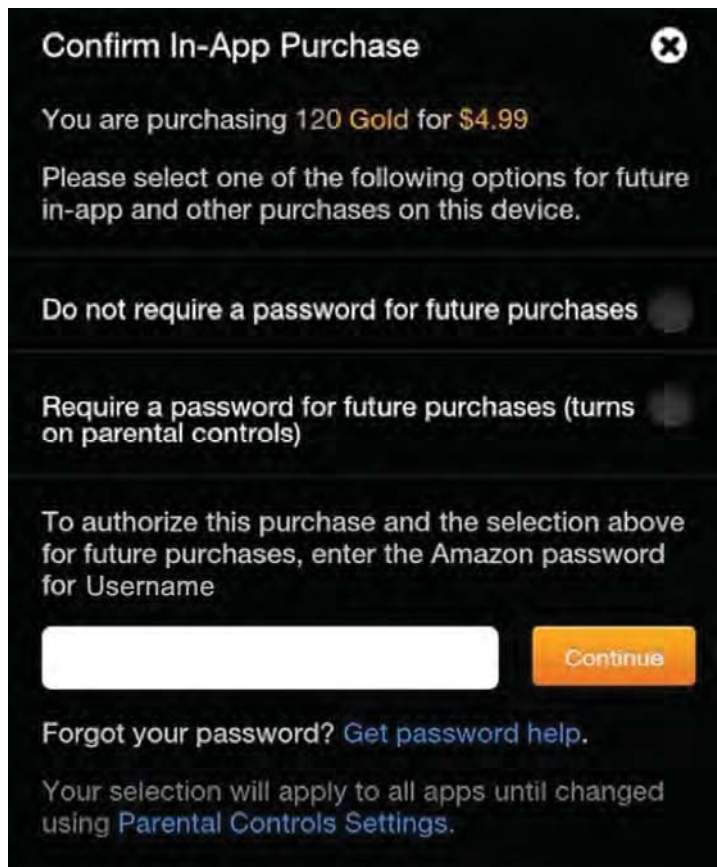
1 The subjects were asked seven questions (see Task 1 in Appendix G) regarding each
2 subject's interpretations for each app-description page. As discussed in Section 2.4.5 , the
3 order of the apps presented was counterbalanced so that previous experimental conditions
4 would not affect the subject's answers. As part of Task 1, subjects were asked to interpret
5 the "PLEASE NOTE" in-app purchase notice, and, as a separate subtask, subjects were
6 asked to interpret the "Key Details" badging and in-app purchasing popup definition. The
7 "PLEASE NOTE" and "Key Details" badging topics were also counterbalanced between
8 subjects.
9

11 2.4.3 Task 2: In-App Purchase Workflow

12 Task 2 evaluated the purchase workflow for the first-time in-app purchases as
13 experienced by Amazon customers in May 2013 ("May 2013 First-Time User
14 Experience" or May 2013 FTUX") and June 2014 ("June 2014 First-Time User
15 Experience" or "June 2014 FTUX"). For this task, the subjects were shown the May 2013
16 FTUX popup and June 2014 FTUX popup displayed to confirm an attempted first-time
17 in-app purchase. In this scenario, the subjects were told that they had given their Fire
18 tablet to their child/grandchild, who is playing a game. The child then gives the Fire
19 tablet back to the subject with the popup showing. This task was randomized between
20 subjects as to which popup (May 2013 versus June 2014) was shown first to the subject.
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27



11 Figure 4. May 2013 FTUX



27 Figure 5. June 2014 FTUX

1 There were two components to this task. The first was a timing task, where the
2 subjects were instructed to flip over the Kindle Fire tablet and read the contents of the
3 screen at the same pace they would if their child or grandchild had just handed them the
4 tablet. Prior to flipping over the Fire tablet to begin, the subjects clicked “Next” on the
5 computer survey, which started a timer unknown to the subjects. The subjects were told
6 to enter the word “password” and click the “Submit” button after they finished reading
7 the popup. Entering any text in the password box and clicking the submit button on the
8 computer stopped each timer (i.e., it was not necessary to enter the correct password as
9 reading time was being measured and not accuracy of password typing).

11
12 The second component to this task asked the subjects a series of questions about their
13 understanding and interpretation of the information and options provided on the popup
14 screens.

16 **2.4.4 Task 3: In-App Purchase Notification and** 17 **Refund Process**

18 Task 3 evaluated the in-app purchase email notification and refund process. For this
19 task, the subjects viewed an in-app purchase email receipt on the laptop and were told
20 that they had received the email from Amazon. The subjects were then told that the
21 product identified in the email was either never purchased or was accidentally purchased
22 by their child or grandchild while using an app and the participants were instructed to go
23 about seeking a refund from Amazon for the unintended charge. The various survey
24 questions in Task 3 asked the subjects to interpret the email.
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27

1 This task was performed on the computer because it is more typical to receive email
2 on a computer than to receive email on a Kindle Fire. This HTML-formatted email
3 message included links that the subject could select as though the email had been
4 received via the subject's inbox. The subjects also had access to an Internet browser (both
5 Microsoft Internet Explorer and Google Chrome) that they could use to find contact
6 information for Amazon customer support, if desired. Both Internet browsers were set to
7 a default home screen of www.washington.edu, which was selected as an unbiased page
8 and not suggestive of using www.amazon.com or a search engine such as
9 www.google.com. The subjects were also provided an active Amazon username and
10 password, which was paired to the email links.
11

12
13 In the survey questions, the subjects were first asked how they planned to contact
14 Amazon to request the refund. The subjects were then instructed to contact Amazon to
15 request the refund for the charge identified in the email in any manner they desired.
16 Facilitators stopped the subjects just before they would reach Amazon (e.g., before
17 dialing the phone or when they found the appropriate web form to contact customer
18 support). During this last task where the user needed to determine how they would
19 contact Amazon regarding the in-app purchase, each participant was timed without their
20 knowledge. Lastly, the subjects were asked their subjective perception of how easy or
21 difficult it was to contact Amazon.
22

23 24 **2.4.5 Task Sequence**

25
26 Task 0 was a demographic survey and was always presented first. Task 3 was an
27 evaluation of the Amazon in-app purchase confirmation email and contacting Amazon

customer support and this task was always presented last. The order of Task 1 and Task 2 as well as the subtasks within Task 1 and Task 2 were counterbalanced, with different subjects performing the tasks in different orders so as not to influence the results due to previous exposure to the various experimental conditions. This counterbalancing was accomplished by the facilitator instructing the subjects which subtask to perform at the various branch points and by whether Tasks 1 or Task 2 was performed first.

This resulted in four different variations. Of the six experiment sessions conducted, two performed Order A, one performed Order B, one performed Order C, and two performed Order D. Due to scheduling and the failure of four subjects to appear, the groups were not evenly balanced across all four orders, but the analysis verified that the order of the tasks and subtasks did not affect subjects' responses (see Section 4.3).

- Order A: (n = 9)
 - Task 1 > Task 1.1 > Task 1.2 > Task 2 > Task 2.1 > Task 2.2
- Order B: (n = 2)
 - Task 1 > Task 1.2 > Task 1.1 > Task 2 > Task 2.2 > Task 2.1
- Order C: (n = 3)
 - Task 2 > Task 2.1 > Task 2.2 > Task 1 > Task 1.1 > Task 1.2
- Order D: (n = 10)
 - Task 2 > Task 2.2 > Task 2.1 > Task 1 > Task 1.2 > Task 1.1

Section 3: Data Analysis

The raw data was retrieved from the Knowledge Anywhere database using a SQL query. This output contained the applicable information for each question, including the question number, question text, answer type (e.g. fill-in versus choice), subject response, and time to respond. Approximately 10,900 rows of data were generated and analyzed for the subjects that participated in the test. The experimental data is available at Appendix J

The raw data was then exported using R data analysis software (version 3.2.2) to create a spreadsheet with one row per subject and two columns for each question (subject response and timing). Because the experiment was counterbalanced with subjects receiving questions in different order, the questions across subjects were matched based on the unique identifier for each question. Responses within topics were collapsed based on the subject identifier number.

Most of the questions called for open-ended responses. Prior to reviewing the data, the research team defined the various elements required in the response to each question such that the response be deemed correct (rather than incorrect). Each response was thereafter individually assessed and coded as either correct or incorrect. The researchers conservatively coded responses; ambiguous responses were coded as incorrect to ensure that the coding did not favor Amazon. In fact, often responses that were coded as incorrect could have been coded as correct because the words used indicate that the subject understood additional costs were involved and Parental Controls were available to

1 prevent those costs. Nonetheless, out of an abundance of caution, where a response was
2 ambiguous, not necessarily erroneous, it was coded incorrect.

3
4 Once each response was coded, all data was tabulated and analyzed using the R
5 statistical software program to identify trends and extrapolate to the general public.

Section 4: Results

4.1 Descriptive Statistics

General demographic information was collected on the subjects prior to beginning the usability tasks. As displayed in Table 1, a comprehensive and applicable sample population was used in this experiment.

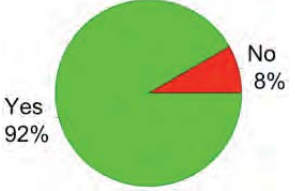

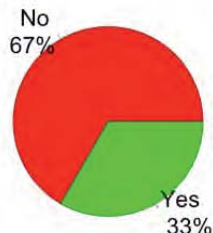


Table 1. Demographic information

<i>Variable</i>	<i>Response</i>	<i>Count</i>
Gender	Male	16
	Female	8
Age (years)	20-29	4
	30-39	9
	40-49	8
	50-59	2
	60-69	1
Highest Level of Education	Some High School	1
	High School Diploma	3
	Some College	11
	Associate Degree	1
	Bachelor Degree	6
	Graduate School	2

In addition, the subjects were asked if they had at least one child or grandchild under the age of 14 years old; all subjects satisfied this criterion. The range of ages for children/grandchildren was 2 years to 13 years old, where many subjects had more than one child/grandchild within this age group. The mean age for children/grandchildren was 7.38 years old, with a standard deviation of 3.39 years.

Descriptive information was also gathered on user experience with smart devices, such as smartphones and tablets. Two subjects had never owned a smartphone and one subject had never downloaded an app onto a smart device. However, when asked during the screening, all subjects stated they were comfortable using a smart device. Table 2 tabulates the responses for users' experience with smart devices.

Table 2. Experience with Smart Devices

Question	Response
Have you ever owned a smartphone, such as an iPhone, Android Phone, or Windows Phone?	 <p>Yes 92% No 8%</p>
Do you currently own a smartphone, such as an iPhone, Android Phone, or Windows Phone?	 <p>Yes 88% No 12%</p>
Have you ever owned an Amazon Kindle Fire tablet?	 <p>No 67% Yes 33%</p>
Do you currently own an Amazon Kindle Fire tablet?	 <p>No 71% Yes 29%</p>
Have you ever downloaded an application (also known as an "app") onto your smartphone or tablet?	 <p>Yes 96% No 4%</p>

4.2 Results by Task

The results from each of the three tasks are individually presented in this section.

4.2.1 Task 1: App Description Page

There were two apps used in this task and all the subjects confirmed that they had never used or downloaded either of the two apps (“Jeweled Bricks” and “Jump Racer”). Therefore, the subjects’ responses are representative of their interpretation of the content controlled within the study, rather than from past experience.

Immediately after first viewing the app-description page for each app, the subjects were asked about what information was provided by the page. For both apps, all 24 subjects were able identify that the page contained content regarding general information about the app, such as game description, reviews, target ages, etc.



Figure 6. What information is provided by this app-description page?

The second question that each subject was asked after navigating to the app-description page for each app was whether they thought it was possible to incur additional costs based on actions taken while using the app. These results are shown in Figure 7. For the app that provided opportunities for in-app purchases, none of the subjects answered incorrectly, meaning all of the subjects (20) correctly understood or were unsure (4) that it was possible to incur additional costs while using the app. Answering unsure is not the same as answering incorrectly because those subjects admit that they do not fully know what is possible within the game play. Although 8 of the subjects were unsure and 3 answered incorrectly about the app with no opportunity for in-app purchasing, their misconception (in the absence of any additional information on the screen) would not result in any accidental purchases made by children because that app does not contain any opportunities for in-app purchases.

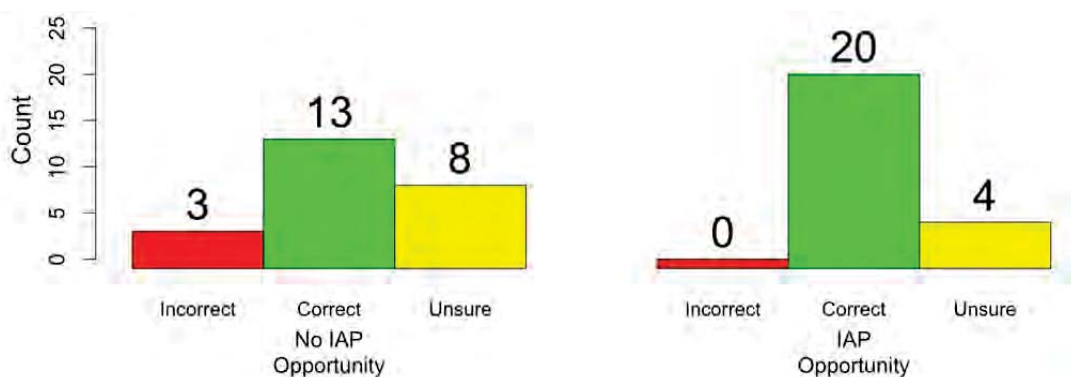


Figure 7. Do you think it is possible to incur additional costs based on actions taken while using the app?

The subjects were then asked questions relating specifically to the “PLEASE NOTE” in-app purchase description under “+ Read More” and the “Key Details” badging for the app with opportunities for in-app purchasing. The “PLEASE NOTE” and “Key Details”

1 subtasks were tested separately, such that a subject was asked to review and interpret the
2 “PLEASE NOTE” description, then review and interpret the “Key Details” badging and
3 in-app purchasing description. The subtask was counterbalanced so that some of the
4 subjects answered questions about the “PLEASE NOTE” description first and the
5 remaining subjects answered questions about the “Key Details” badging first. For ease of
6 presentation and comparative purposes, the discussion and figures below address the
7 “PLEASE NOTE” and “Key Details” results together.
8

9 After viewing each of the “PLEASE NOTE” and “Key Details” concepts, subjects
10 were also asked about how they could limit being charged money for actions taken while
11 using the app. The responses were coded as correct if they mentioned Parental Controls
12 setting up a password (see Figure 8). There were 48 total responses for the “PLEASE
13 NOTE” (24) and “Key Details” (24) questions with 45 correct answers. The sole
14 incorrect response regarding the “Key Details” content was so coded because the
15 response was too vague, not because it was erroneous. In fact, the language suggests that
16 like all other 23 subjects, even this subject understood that account holders could enable
17 Parental Controls to prevent unauthorized in-app purchasing: *“it is implied that you can
18 down [sic] this with parental controls. But, noyt [sic] specifically stated. I am not
19 certain.”*
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21
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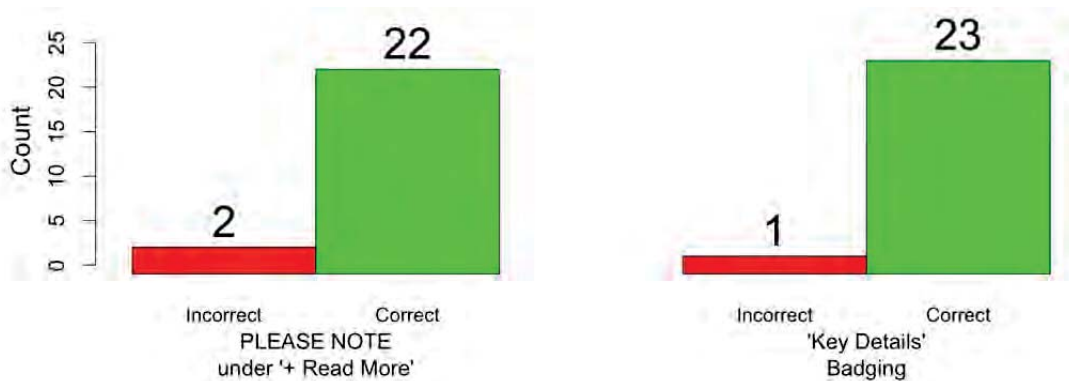


Figure 8. What, if anything, do you think you can do if you want to prevent being charged money for actions taken while using the app?

For both the “PLEASE NOTE” and “Key Details” concepts, the subjects were asked about their understanding of Parental Controls (Figure 9) and the term in-app purchasing (Figure 10). All but one subject correctly understood the purpose of Parental Controls in the context of in-app purchasing as described in the “PLEASE NOTE” description, and all but one subject correctly understood the meaning of Parental Controls in the context of in-app purchasing as identified in the “Key Details” badging. The sole incorrect response about the “PLEASE NOTE” description was so coded because the subject seemed to indicate that Parental Controls have the ability to monitor application usage. That said, the subject had a good understanding that Parental Controls were for parents or legal guardians and was used for applications: “*Settings where parents or legal guardians can monitor other’s current application usage.*” The sole incorrect response within the “Key Details” badging was so coded because the response did not explicitly mention that Parental Controls can prevent unauthorized in-app purchasing: “*parental controls’ allows me to monitor the content that my child is getting exposed to. I can set the levels with regards to violence, language etc.*”

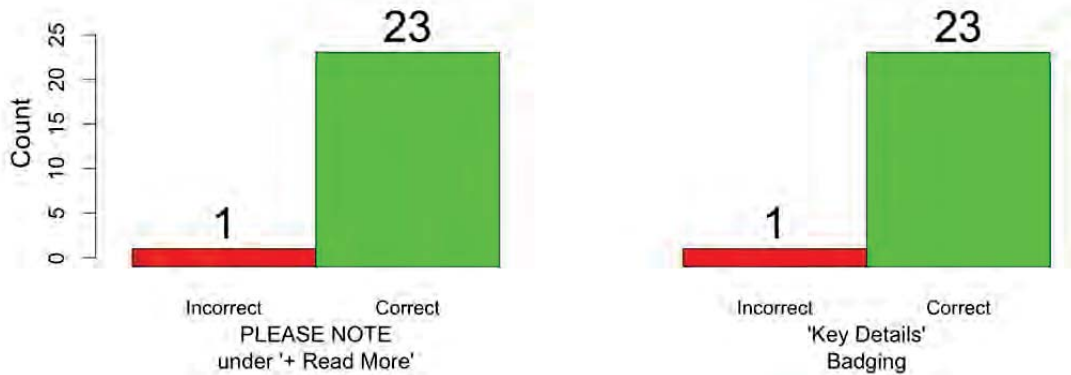


Figure 9. As it is displayed on this page, what is your understanding of 'Parental Controls'?

With regard to Figure 10, 23 out of 24 subjects correctly understood the meaning of in-app purchasing as the term was used on the "Key Details" badging. The sole incorrect response within the "Key Details" badging was so coded because the subject indicated that the purchase was within the "site" rather than within the application, but the subject clearly demonstrated that they were aware that an in-app purchase results in a purchase: *"making purchase while on this site."* All but one subject correctly understood the meaning of in-app purchasing as the term was used in the "PLEASE NOTE" description. The sole incorrect response within the "PLEASE NOTE" description was so coded because the response was too vague about purchases within an app, *"buying while on this site."*

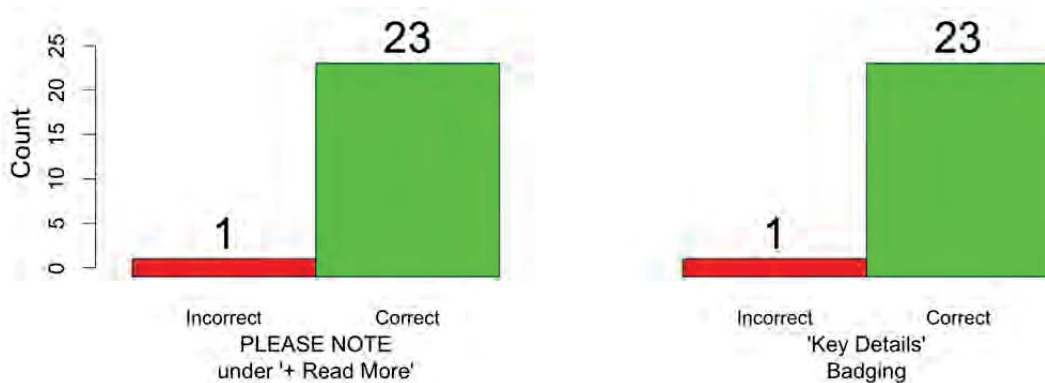


Figure 10. As it is displayed on this page, what do you understand the phrase 'In-App Purchasing' to mean?

All 24 subjects properly interpreted the phrase “which allows you to buy items within the app using actual money” to mean they would be charged real currency, withdrawn from their credit card on file with Amazon (see Figure 11).

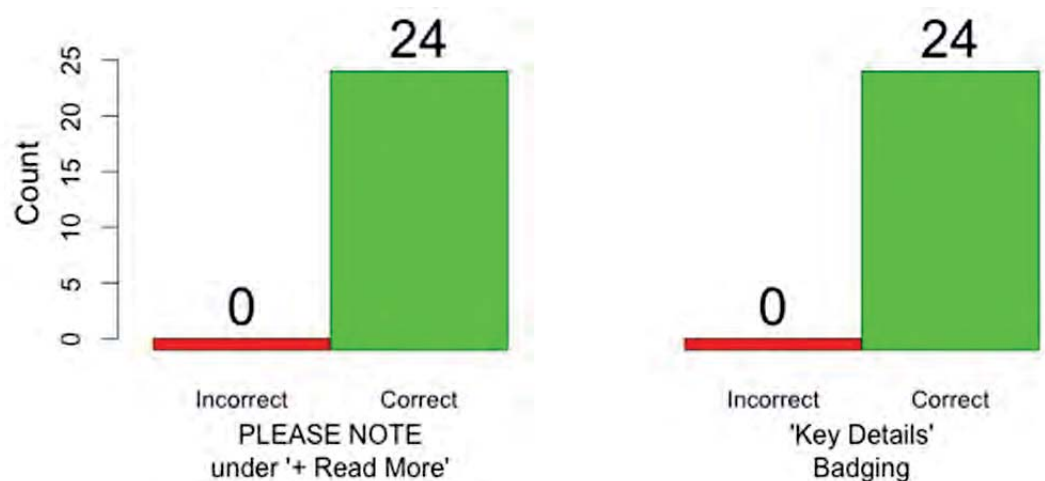
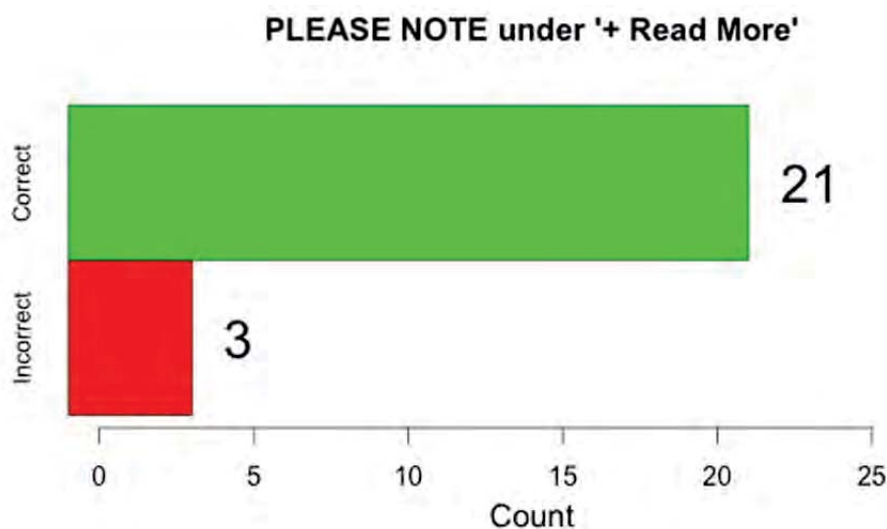


Figure 11. As it is displayed on this page, what do you understand the phrase 'which allows you to buy items within the app using actual money' to mean?

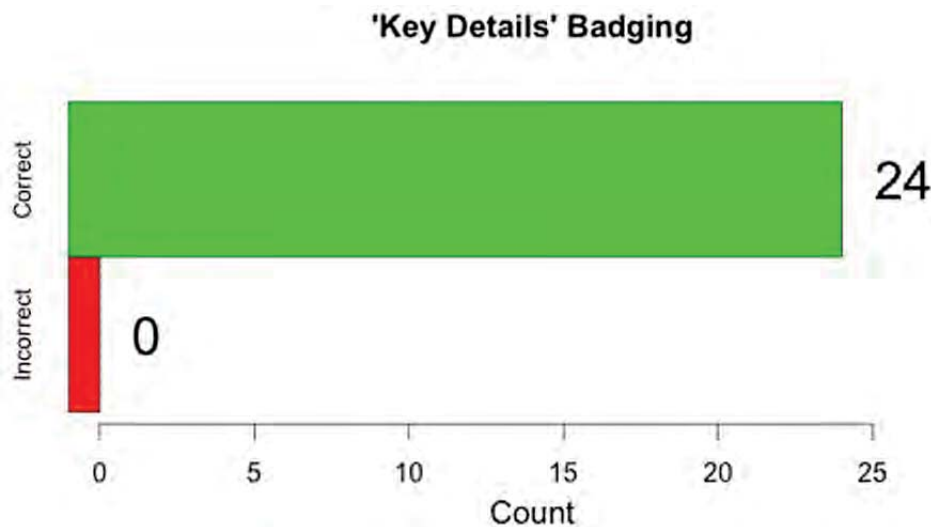
Subjects were asked one additional question about the “PLEASE NOTE” content, which was a general question about what they understood by the information provided in the “PLEASE NOTE” description (see Figure 12). All but three subjects correctly

1 understood its meaning. Two of the three incorrect responses were so coded because their
2 language implied that the user would have to purchase more content later in the future to
3 continue playing the game. This misconception would not result in any accidental
4 purchases, however, because at this point the user thinks they will need to spend money
5 to progress in the future and still has the opportunity to choose not to download the app.
6 These responses were “*You will be expected to purchase additional tools and features*
7 *via in-app purchasing*” and “*letting the costomer [sic] know that with buying the*
8 *particular app you will have to purchase items later.*” The third incorrect response was
9 so coded because it was too vague, though even it suggests that the subject understood
10 that it meant purchases could be made within the app: “*using this too [sic] buy w/ money*
11 *using in-app site.*”
12



23 Figure 12. As it is displayed on this page, what do you understand this text to mean?
24
25
26
27

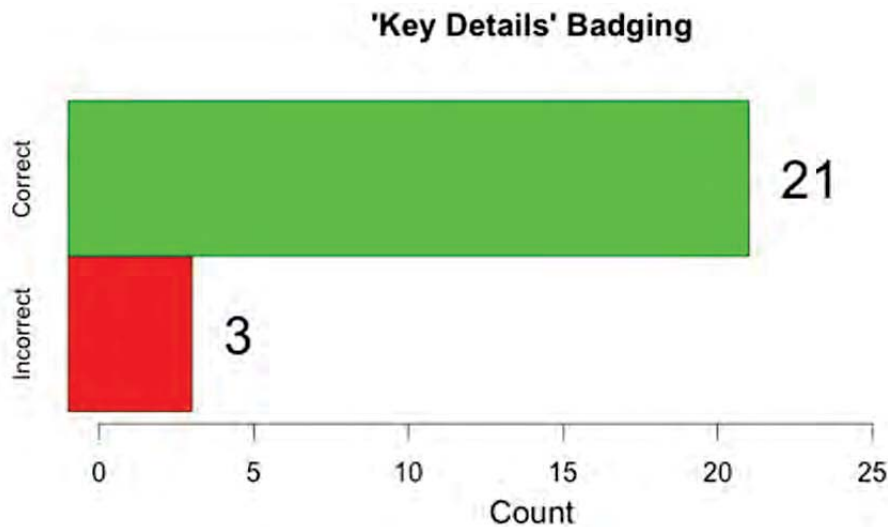
1 Similarly, subjects were asked to interpret what they understood the “Key Details”
2 badging to mean. All 24 subjects correctly identified that this content was to point out
3 important information regarding the app; see Figure 13.



14 **Figure 13. As it is displayed on this page, what do you understand the phrase ‘Key**
15 **Details’ to mean?**

16 Before being instructed to tap on the “Key Details” badging to access the popup
17 window with additional information, the subjects were asked what they understood the
18 bullet point “In-App Purchasing” to mean (see Figure 14). All but three answers were
19 correct. Of the three responses coded incorrect, one misunderstood the question and
20 explained what happens when clicking on “Key Details”: *“well when you click on the*
21 *key details section it brings up a more in depth description of what it means. (enhanced*
22 *functionality, game content etc).”* Another was coded incorrect because it implied that
23 additional content would need to be purchased in the future to play the game, though
24 even that response suggests that the subject understood that it meant purchases could be
25 made within the app: *“app will need further purchases to operate the app being*
26
27

1 *played.*”. The last response was coded incorrect because it was vague and difficult to
2 understand: “*purchaseing [sic] this game while on site.*”



13 **Figure 14. As it is displayed on this page under 'Key Details' text, what do you**
14 **understand the phrase 'In-App Purchasing' to mean?**

15 The subjects were then instructed to tap on the “Key Details” badge and read the
16 content under “In-App Purchasing” in the popup window. After reading this content, they
17 were asked their understanding of the displayed text. All 24 subjects were able to
18 correctly state that the app would allow opportunities to make purchases within the app
19 using actual money (see Figure 15).

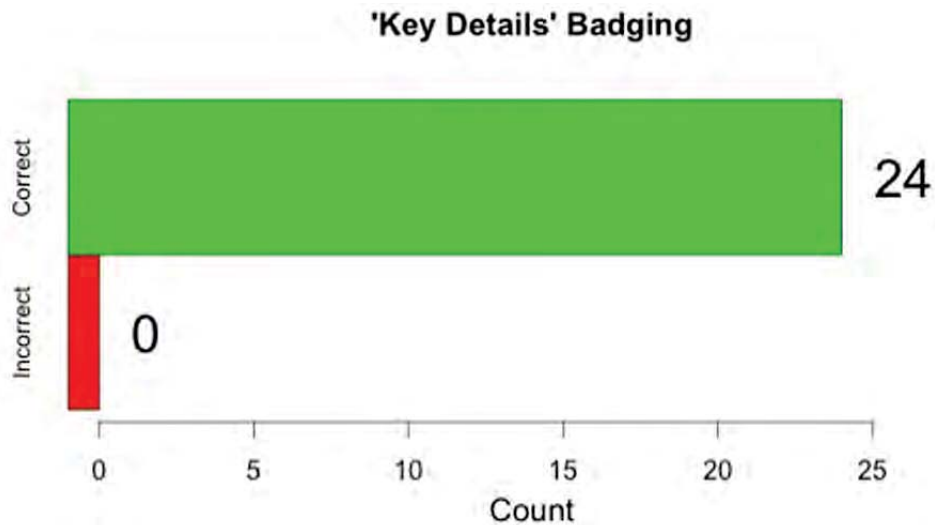


Figure 15. As it is displayed on this page, what do you understand the text under 'In-App Purchasing' to mean?

4.2.2 Task 2: In-App Purchase Workflow

Subjects were provided screenshots of the May 2013 FTUX and June 2014 FTUX first-time in-app purchase confirmation popup. The subjects on average spent 10 more seconds reading the June 2014 FTUX than reading the May 2013 FTUX.²

Table 3. Time to read and input password: May 2013 vs. June 2014 FTUX

FTUX Popup	Time (seconds)			
	Mean	Standard Deviation	Minimum	Maximum
May 2013	25.17	6.82	15	39
June 2014	35.79	12.54	25	83

² A paired t-test was used to compare the timings to read each FTUX, on a participant level. The results showed that there was a mean difference of 10.625, for $p < 0.001$. This indicates that there was a significant difference between each subject's times to read the two FUX popups. More specifically, the June 2014 FTUX took on average 10.625 seconds longer to read as compared to the May 2013 FTUX. The results of the timings between these two displays are provided in Table 3.

1 After reading each FTUX popup, the subjects were asked questions regarding
2 their understanding of each screen. The first question for each task asked subjects, “What
3 is the purpose of this page?” All 24 subjects correctly identified the primary purpose of
4 the May 2013 FTUX as asking whether they confirm an in-app purchase; 23 subjects
5 correctly identified the same for the June 2014 FTUX (Figure 16). The one incorrect
6 response for June 2014 failed to identify the purpose of confirming the current in-app
7 purchase (noting that the purpose was “[t]o inform you that a purchase has just been
8 made”).

11 Subjects were then asked, “What are your options as described by this page?”
12 This question was designed to test whether the subject identified the option of turning on
13 Parental Controls to require a password for future in-app purchases. For the May 2013
14 FTUX, 21 subjects correctly identified that option and 22 subjects identified that option
15 in response to the June 2014 FTUX (Figure 17). The three incorrect responses for the
16 May 2013 FTUX did not identify the option to require a password for future in-app
17 purchases: “Enter your password to complete purchase” and “to buy or not to buy” and
18 “you can allow a purchase by giving password and this password will also be required
19 for any future purchases.”

22 The two incorrect responses for the June 2014 FTUX are listed below. In the first
23 response, the subject did not know if he or she could cancel the in-app purchase: “*Im*
24 *[sic] not sure if you can stop the purchase just made the child or not- it is unclear to*
25 *me from the wordikng [sic]. Yo may set a password tocpnfir [sic] future purchasing*
26 *or choose to allow no password confirmation for future purchasikng [sic].”* In the

second response, the subject failed to address the Parental Controls aspect of the dialog:
“to require a password.”.

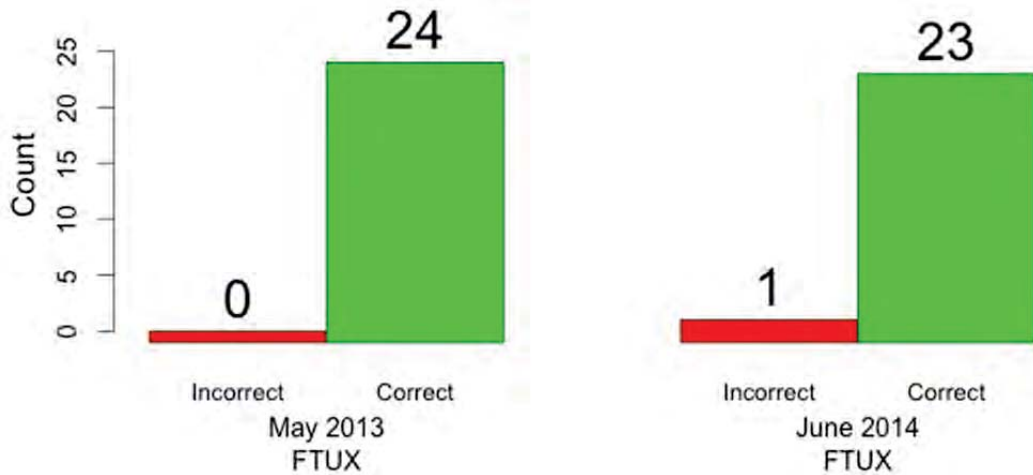


Figure 16. What is the purpose of this page?

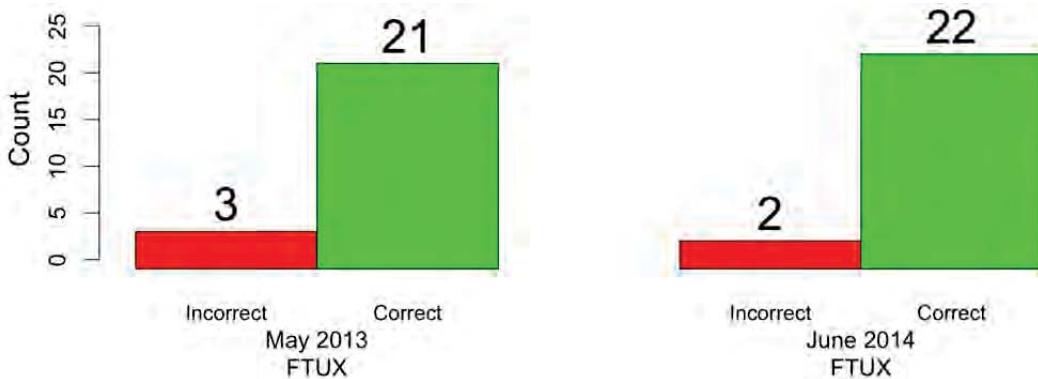


Figure 17. What are your options as described by this page?

Figure 18 through Figure 20 provide the results for questions that were asked identically between the two FTUX popups. For the question asking what would happen if the subject closed the screen without entering the password (Figure 20), there were three

incorrect responses. One of the responses was so marked incorrect because it addressed only issues pertaining to Parental Controls, not that it was erroneous with respect to canceling the particular in-app purchase: *“No limits will be set on my account unless I take the step to go to Parental Controls and set limits.”* Another was so marked incorrect because it simply reiterated the question, not that it was erroneous with respect to canceling the particular in-app purchase: *“it will close.”*

For the June 2014 FTUX, the sole response coded incorrect for interpreting the meaning of Parental Controls was so coded because it was too vague as to what the subject meant: *“on adults are too use for their use.”* There were three answers coded incorrect for the question asking about the consequences of closing the window without entering the password. Two of the responses were coded incorrect because they did not address what would happen regarding the in-app purchase, not because they were erroneous: *“it will close”* and *“i think it will go back to the main page of the app, homepage, etc.”*

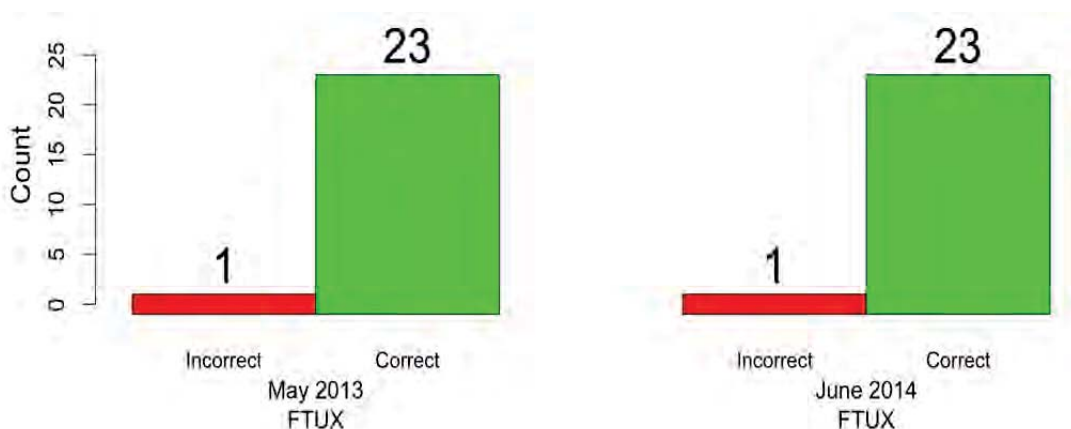


Figure 18. As it is displayed on this page, what is your understanding of ‘Parental Controls’?

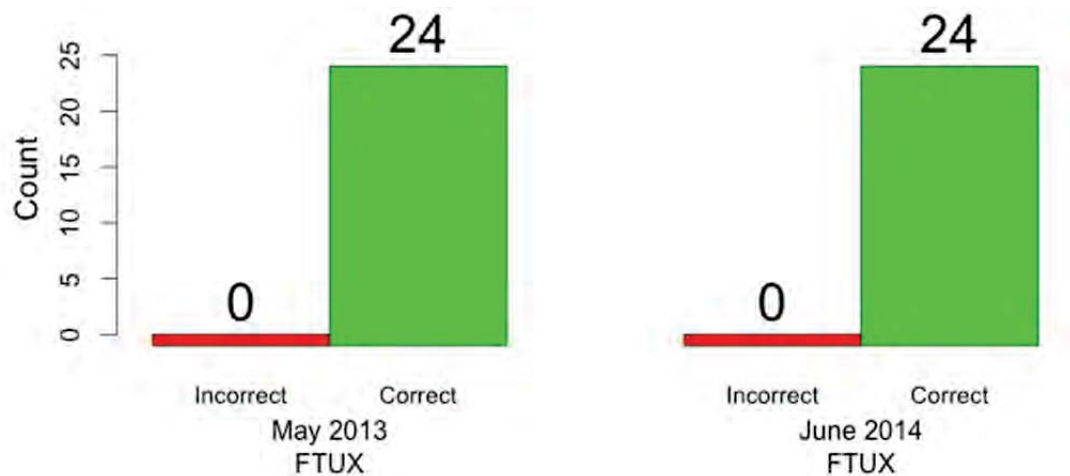


Figure 19. What, if anything, do you think you can do to prevent being charged money for actions taken while your child/grandchild use the app?

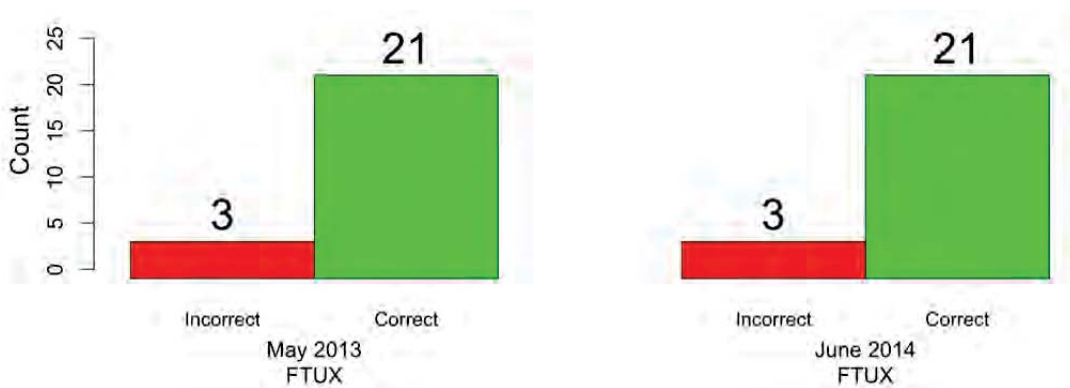


Figure 20. What do you think will happen if you close the screen without entering your password?

The subjects were asked additional questions about the May 2013 FTUX and June 2014 FTUX using varying wording depending on the specific text used for the individual dialog box. The results are provided in Table 4.

Table 4. Interpretations of the two FTUX popups

FTUX Popup	Question	Response
May 2013	As it is displayed on this page, what do you understand the phrase "which allows you to buy items inside the app using real money" to mean?	Correct: 24 Incorrect: 0
May 2013	As it is displayed on this page, what do you understand the phrase "This app contains in-app purchasing" to mean?	Correct: 23 Incorrect: 1
June 2014	As it is displayed on this page, what do you understand the phrase "In-App Purchase" to mean?	Correct: 23 Incorrect: 1
May 2013	What do you think will happen if you enter your password and select "Continue"?	Correct: 21 Incorrect: 3
June 2014	What do you think will happen if you select "Do not require a password for future purchases," enter your password, and select "Continue"?	Correct: 22 Incorrect: 2
June 2014	What do you think will happen if you select, "Require a password for future purchases (turns on Parental Controls)," enter your password, and select "Continue"?	Correct: 23 Incorrect: 1
May 2013	As it is displayed on this page, what do you understand the phrase "If you'd like to require a password for future in-app purchases, please turn on Parental Controls" to mean?	Correct: 22 Incorrect: 2
June 2014	As it is displayed on this page, what do you understand the phrase "Do not require a password for future purchases" to mean?	Correct: 24 Incorrect: 0
June 2014	As it is displayed on this page, what do you understand the phrase "Require a password for future purchases (turns on Parental Controls)" to mean?	Correct: 23 Incorrect: 1

For the May 2013 FTUX, all 24 subjects correctly understood that "buying items inside the app using real money" would cost them actual currency from their credit card on file with Amazon.

In the second row of Table 4, 23 out of 24 subjects correctly answered the question about the meaning of applications that contain in-app purchases. The sole incorrect response was so coded because the subject did not indicate why he or she would be charged, even though the subject seems to well understand that he or she would need to access an electronic form of payment and therefore presumably be charged once that

1 electronic form of payment was accessed: “*You need access to an electronic form of*
2 *payment.*” The one response coded incorrect for the June 2014 FTUX was so coded
3 because it was too vague, not because it was erroneous: “*purchasing in-house apps.*”
4

5 All but three subjects correctly understood what would occur on the May 2013 FTUX
6 if they entered their password and continued. Two responses were coded incorrect
7 because they did not mention that the in-app purchase would be completed, though even
8 those responses suggest that the subjects understood the process would be completed: “*it*
9 *will go bac [sic] to app*” and “*it will continue too [sic] site.*” All but two subjects
10 correctly understood what would occur on the June 2014 FTUX when the “Do not require
11 a password for future purchases” option was selected. One response was coded incorrect
12 because the subject thought there would be a follow-up popup window that confirmed the
13 future password requirement decision, though even that response suggests that the
14 specific purchase would require a password and additional passwords may still be
15 required: “*it will most likely still make me type in the password for this purchase and*
16 *perhaps confirm with a question whether or not i want to remove the password*
17 *requirement for future purchases for sure.*” All but one subject correctly understood
18 what would occur on the June 2014 FTUX when the “Require a password for future
19 purchases (turns on Parental Controls)” option was selected. The sole incorrect response
20 was so coded because the answer was too vague, not because it was erroneous: “*it will*
21 *continue on*”.

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23
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25 For the May 2013 FTUX, the subjects were asked about their understanding of the
26 phrase “if you’d like to require a password for future in-app purchases, please turn on
27 Parental Controls.” All but one subject correctly understood the meaning of that phrase.

1 The vast majority of the subjects answered this question correctly. There were two
2 responses out of 24 that were coded as incorrect. One of the responses was coded
3 incorrect because the response indicated that the subject was not sure if the current
4 purchase could be immediately canceled, though even that response indicates that the
5 subject understood that settings were available to control future purchases: “*meaning*
6 *that maybe you can not stop the transaction in process but can set your settings to*
7 *control how purchases are approved in the future*”. The other response that was coded
8 incorrect was coded as such because the subject did not talk about the need for users to
9 provide a password when trying to make in-app purchases in the future. That said, the
10 response revealed that the subject realized that users would need to provide a password:
11 “*In order to turn on this feature you need to provide a password.*”
12

13
14 All 24 subjects correctly understood that the option in the June 2014 FTUX for “do
15 not require a password for future purchases” meant that future in-app purchases could be
16 made without entry of a password. All but one subject correctly understood the meaning
17 of the option “Require a password for future purchase (turns on Parental Controls)” in the
18 June 2014 FTUX. The sole response coded incorrect was so coded because the subject
19 did not appear to understand the context of the question: “*Make it so that if you think*
20 *your password is compromised, you can change on PC and the tablet will double*
21 *check.*”
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4.2.3 Task 3: In-App Purchase Notification and Refund Process

The subjects were asked their understanding of the information provided in the in-app purchase order-confirmation email. The summary of their responses is provided in Table 5. Note that for this task, the computer system failed to record one of the subject's responses for some of the questions; therefore, there are only a total of 23 responses for some of the questions related to the last part of this Task 3. Of the 11 total survey questions asked within Task 3, responses to four questions were collected by all 24 subjects.

All of the subjects correctly answered the questions about the information provided by the email order confirmation; everyone identified what information was provided in the email, what product was ordered, when it was ordered, and how much the credit card had been charged.

Table 5. Interpretations of email notification

Question	Correct	Incorrect
What information is provided by this email?	24	0
As described in this email, what is the name of the product that has been ordered?	24	0
As described in this email, when was this product ordered?	24	0
If you received this email, do you think your credit card on file with Amazon has been charged for buying this product?	24	0
How much money do you think your credit card on file with Amazon has been charged for this order?	23	0

Before the subjects were told they were going to actually contact Amazon, they were asked what methods they would use to contact Amazon to request a refund. Their responses about which modality they would use are summarized in Table 6. Note that for

this task their computer screen displayed the email notification, which may explain why so many subjects referenced the links within the email.

Table 6. Possible ways to contact Amazon to request refund

Question	Modality	Count
What possible way or ways could you try to contact Amazon and request a refund from Amazon?	www.amazon.com	4
	Links in email	10
	Online chat	2
	Phone	6
	Email	6
	Unsure	1
Are there other possible ways to contact Amazon to request a refund? Please identify.	www.amazon.com	3
	Links in email	4
	Online chat	4
	Phone	6
	Email	2
	Amazon Appstore	1
	Unsure	6

All subjects were successfully able to contact Amazon to request a refund (that is, all of the subjects located the pertinent information to call Amazon directly, have Amazon call them, begin an online chat with customer service, or complete the online form, at which point the facilitator told the subject he or she was finished). The methods the subjects tried included visiting www.amazon.com, www.google.com, locating a phone number, online chat, and email. It took the subjects an average of 5.26 minutes to contact Amazon, with a standard deviation of 3.72 minutes. However, outliers substantially skewed this, where the range was 14 seconds to 15.9 minutes. The subjects were also asked their subjective perception of how easy or difficult it was to contact Amazon, which was based on a 5-point Likert scale. The results of this are provided in Table 7.

1 **Table 7. Likert scale on difficulty to contact Amazon**

2

Question: How difficult was it to contact Amazon before the facilitator told you to stop?				
3 Very Easy	Easy	Neutral	Difficult	Very Difficult
4 1	2	9	8	3

5
6 Not surprisingly in light of the subjective nature of the question, responses to the
7 question on how difficult to contact Amazon include some anomalous results. For
8 example, one subject who said the task was “very difficult” completed it in 1:54. Two
9 subjects deemed the task “difficult” despite completing it in 14 seconds and 2:26,
10 respectively. The former of these two subjects considered the task “difficult” because she
11 *“was using someone else[']s name and purchases.”* A subject who completed the task in
12 41 seconds answered “Neutral.” By comparison, a subject who completed the task in 5:10
13 responded that it was “easy” to contact Amazon.
14
15

16 **4.3 Counterbalance Validity**

17 The order of Tasks 1 and 2, as well as the subtasks within Task 1 and Task 2 were
18 counterbalanced across participants. There were four variations of ordering that were
19 used in the experiment (see Section 2.4.5). By controlling the order of the tasks, the
20 results are robust against variation due to exposure within the study (e.g., knowledge
21 acquired and carried across tasks or adjusting to experiment setting).
22
23

24 There were very few responses that were incorrect; in fact, many of the questions had
25 no incorrect responses and several only had one incorrect response. Therefore, a
26 statistical analysis on differences between the groups would not yield significant power.
27 However, it is apparent from analyzing the data that the distribution of incorrect

1 responses was not correlated with the ordering of the tasks. Therefore, these results are
2 not subjective based on exposure.

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Section 5: Discussion

The results of the usability study overwhelmingly indicate that subjects understood the various interfaces and workflow associated with Amazon Kindle Fire in-app purchases.

Parents and grandparents with children/grandchildren under the age of 14 years old participated in this study. All of the subjects were comfortable using a smart device given their responses from the initial screening questions. The cohort included people with and without experience using an Amazon Kindle Fire. The sample population used in this study was an accurate representation of the general public: the study included males and females, a comprehensive assortment of age groups, and a wide range of education levels.

The study counterbalanced experiment tasks and subtasks to account for exposure. Furthermore, the study was designed to be as unbiased as possible, in order to accurately evaluate what subjects understood and noticed regarding the various interfaces associated with in-app purchases. The majority of the questions asked for short-answer (fill-in the text box) responses from the subjects. This eliminated the potential for the study to provide suggestive answers (e.g., multiple choice). The open-ended questions were categorized as either incorrect or correct by the research team. Prior to reviewing the responses, a criterion for each question's response was determined. In cases where the subject's response was unclear, the response was marked as incorrect to ensure conservative results that did not improperly favor Amazon.

None of the participants had ever played or downloaded any of the apps used in the analysis. Therefore, their responses were not subject to influence through past experiences with the apps.

5.1 App Description Page

Task 1 tested the following opinions offered by Ms. King:

- The in-app purchasing notice and “Key Details badge” contained on app-description pages “does not effectively convey to consumers that children can incur IAPs [in-app purchases], that they can incur in-app charges without parental involvement, or that they would have to change their device settings to prevent children from incurring in-app charges” (p. 32);
- The text of the Key Details overlay “contains no direction discussion” of the “fact that IAPs have real costs associated with them that will result in charges to the customer’s Amazon account” (p. 27);
- Customers must already be familiar with the term “in-app purchases” for the Key Details badge to have “any” impact (p. 30);
- The language of the Key Details badge, the Key Details overlay, and the in-app purchase notice are “unnecessarily vague” (p. 30);
- Account holders would not understand that they can activate Parental Controls to limit or prevent unauthorized in-app purchases made by others who are using a tablet linked to owner’s Amazon account (pp. 30-31); and
- The term “Parental Controls” ineffectively conveyed that account holders could restrict unauthorized purchases (p. 31).

The test results are wholly inconsistent with the above-listed opinions of Ms. King.

All of the subjects clearly identified what type of information was presented on the app-description page (Figure 6). After viewing the app-description page and being asked if there was potential to incur additional costs based on actions taken while using the app, there was very little confusion that would have resulted in unwanted charges (Figure 7).

1 The majority of the subjects correctly identified that the app without opportunity for in-
2 app purchases would not result in additional costs. Although some subjects were unsure
3 or incorrect in their interpretations, this misconception could not have resulted in
4 additional costs to the consumer.

6 For the app with in-app purchase opportunity, none of the subjects incorrectly
7 interpreted the information (Figure 7). In other words, zero subjects said there was no
8 opportunity to incur additional charges. When asked to identify possible ways to prevent
9 being charged money for actions taken while using the app, 92% correctly answered after
10 reading "PLEASE NOTE" content and 96% correctly answered after reading the "Key
11 Details" content (Figure 8).

13 After reading the "PLEASE NOTE" content, 96% of the subjects correctly
14 understood Parental Controls (Figure 9) and 96% understood the phrase "in-app
15 purchasing" (Figure 10). After reading the "Key Details" content, 96% understood
16 Parental Controls (Figure 9) and 96% understood the phrase "in-app purchasing" (Figure
17 10). All of the subjects were able to correctly interpret the phrase "which allows you to
18 buy items within the app using actual money." (Figure 11). Furthermore, after viewing
19 the popup by selecting "Key Details" and reading the section about in-app purchasing,
20 100% of the subjects correctly described the meaning of in-app purchasing (Figure 13)..

23 King indicated that it was inadvisable to "wait until the end of the checkout process"
24 to discuss in-app purchasing (p. 21). These results indicate that there is ample previous
25 disclosure about in-app purchasing prior to "checking out." This disclosure is provided
26
27

1 by the “Key Details” badging, the “PLEASE NOTE” indication, and the “Key Details”
2 popup, and the study indicated that this information was well understood.

3 4 **5.2 FTUX Popups**

5
6 Task 2 tested Ms. King’s opinions about the May 2013 FTUX and June 2014 FTUX.

7 Ms. King opined that:

- 8 • The dialog box presented beginning in May 2013 for all first-time in-app
9 purchasers was ineffective for “many users” (pp. 36-39);
- 10 • Customers who read the May 2013 dialog box “may be confused” about its
11 meaning (p. 37);
- 12 • The term “real money” was confusing in the absence of a dollar amount or
13 dollar sign (p. 37);
- 14 • Customers may “assume” that the May 2013 dialog box “is a routine security
15 check rather than a financial authorization” (pp. 37-38);
- 16 • The text of the May 2013 dialog box is “not clear” and the term “future in-app
17 purchases” is vague (p. 38).

18 On the contrary, the results from the May 2013 and June 2014 FTUX in-app purchase
19 workflow show that Amazon clearly communicated the relevant information to
20 parents/grandparents across both time periods. Although King is critical of the wording
21 and design of the FTUX popups, the study results demonstrate that they communicate
22 clearly and effectively.

23
24 Despite the shorter text of the May 2013 FTUX, subjects understood that the popup
25 provided the option to require a password for future in-app purchases nearly as well as
26 when shown the revised and expanded content within the June 2014 FTUX. For the May
27 2013 FTUX, 88% of the subjects understood the options that were available to them as

1 presented in the popup (Figure 17), and 96% understood what Parental Controls were and
2 how to prevent being charged for actions taken while their child/grandchild use the app
3 (Figure 18). After reading the May 2013 FTUX, all of the subjects understood the
4 meaning of the phrase “which allows you to buy items inside the app using real money”
5 (Table 4).
6

7 King indicated that there may be some customer confusion over the use of the term
8 “real money” in the in-app purchasing confirmation prompt to indicate that actual costs
9 would be incurred (p. 37). All study participants understood “real money” to mean that
10 their credit card on file with Amazon would be charged.
11

12 For the June 2014 FTUX, 23 out of 24 subjects (96%) understood the purpose of the
13 page (Figure 16) and the meaning of Parental Controls (Figure 18). After reading the
14 June 2014 FTUX, all of the subjects were able to identify how to prevent being charged
15 money for actions taken while their child/grandchild used the app (Figure 19). Although
16 3 out of 24 subjects incorrectly interpreted what would happen if they close the screen
17 without entering their password (Figure 20), this misconception would not have resulted
18 in additional or unwanted charges.
19
20

21 When asked about the term in-app purchasing, 96% correctly defined it after reading
22 the May 2013 FTUX and 96% also correctly defined it after reading June 2014 FTUX
23 (Table 4). When asked specifically about their options within the popup, 21 out of 24
24 correctly stated what would happen if they selected continue (May 2013 FTUX), 22 out
25 of 24 correctly stated what would happen if they selected “Do not require a password for
26 future purchases” and “Continue” (June 2014 FTUX), and 23 out of 24 correctly stated
27

1 what would happen if they selected “Require a password for future purchases” and
2 “Continue” (June 2014 FTUX) (Table 4). Moreover, 22 out of 24 correctly understood
3 the phrase “If you’d like to require a password for future in-app purchases, please turn on
4 Parental Controls” after reading the May 2013 FTUX (Table 4). All 24 correctly
5 understood the meaning of the phrase “Do not require a password for future purchases”
6 on the June 2014 FTUX, and 23 out of 24 correctly understood the meaning of the phrase
7 “Require a password for future purchases (turns on Parental Controls)” on the June 2014
8 FTUX (Table 4).

10 King indicated that customers presented with the May 2013 FTUX may not
11 understand that, by entering a password to authorize an in-app purchase, they were
12 permitting in-app purchases to occur without password entry (pp. 36-37). I believe that
13 the dialog box is quite clear in the regard. The May 2013 prompt stated: “*If you’d like to*
14 *require a password for future purchases, please turn on Parental Controls.*” Study
15 participants had no trouble correctly understanding this language.

18 With regard to the in-app purchasing verification window, King also indicates that
19 “the only direct action one can take in this window other than to cancel is to enter one’s
20 password” (p. 37). It is not clear to me what other action should be available, as for the
21 vast majority of users this should be a binary decision point: enter a password to make the
22 purchase or click Cancel to decline the purchase. Introducing other options would clutter
23 the dialog box, potentially require scrolling, and generally make the dialog box more
24 difficult to understand or use.

5.3 Purchase Notifications and Refunds

The results from the study also indicate that Amazon clearly communicated information regarding the notification that an in-app purchase was made. After viewing the in-app purchase notification email, all of the subjects were able to correctly interpret the information provided. All of the subjects were able to clearly state what information was provided in the email, the name of the product that had been ordered, when it had been ordered, and how much the credit card had been charged.

When asked how they would seek a refund from Amazon for the purchase, 22 out of 23 subjects (a computer malfunction caused one subject's data to not be collected) were able to identify pertinent modalities of communication (Table 5). Even though the survey questions relating to contacting Amazon were only collected for 23 of the subjects, all 24 subjects attempted to contact Amazon for a refund. All 24 subjects successfully reached the point where they were about to commence a connection with Amazon customer service (e.g., dial the phone number, open an online chat). The average time it took subjects to reach this point was 5.26 minutes, with a range from 14 seconds to 15.9 minutes. Nearly 40% of the subjects completed the task in under 3 minutes, while nearly 75% completed the task in 6:12 or under.

As noted above, some of the responses describing how difficult it was to contact Amazon reveal inconsistencies across subjects when compared against the time it took to complete the task. For example, it is difficult to reconcile the response that it was "difficult" to contact Amazon for the subject who completed the task in 14 seconds. The responses also demonstrate the importance of an individual's expectations, as some

1 subjects considered the task “difficult” or “very difficult” when completing it in under
2 3 minutes, while another subject who finished in just over 5 minutes thought it was
3 “easy” to contact Amazon.
4

5 With regard to subjects’ expectations, it should be noted that Amazon’s reputation for
6 excellent customer service is well known. Subjects were not asked to contact the
7 customer service department for any other company, nor were they asked their perception
8 of how difficult it was to contact Amazon in comparison to their experience with any
9 other company. It is my opinion that the responses could have been influenced by
10 subjects’ high expectations for Amazon and their consideration of the task in isolation,
11 without comparison to other companies.
12

13 Regarding the time required to contact Amazon, although the experimenters tried to
14 create an environment that was as close as possible to the environment that the users
15 would experience at home, it is important to note that this task may have been more
16 difficult and more complex than it would have been if experienced in the user’s home
17 environment. For example, subjects were in a room with up to four other people
18 completing the same task. It is difficult to determine if this setting accidentally tunneled
19 subjects towards one modality, when they may have tried something else if they had been
20 at home. Also, there are many ways to reach Amazon’s Contact Us page, but many
21 require multiple clicks.³ Although the facilitator told subjects it was not a race, the
22 presence of others in the room may also have led some subjects to start down a path to
23
24

25 ³ Amazon’s Supplemental Responses and Objections to Plaintiff’s Third Set of Interrogatories
26 (September 28, 2015), at 2-12. For example, the Contact Us page can be reached by clicking on “Your
27 Apps and Devices” in a confirmatory email, then selecting “Customer Service” on the left of the screen;
similarly, clicking on “Your Account” or the Order ID in a confirmatory email, then clicking “Help,” will
provide numerous routes to reach the Contact Us page with one or two additional clicks.

1 contact Amazon and quickly abandon it if not immediately successful. One subject wrote
2 that it was confusing for them to be using someone else's Amazon account.

3
4 On December 6, 2015, I was provided a copy of a survey for this case conducted by
5 Dr. Barry A. Sabol.⁴ I reviewed Dr. Sabol's report, which summarized the findings of a
6 survey of 1,237 Amazon customers (with children under the age of 17 living in their
7 households) who had purchased a digital product from Amazon, including 301 in-app
8 purchasers.⁵ The 272 respondents who had previously contacted Amazon customer
9 service about a digital product were asked the following question: "Compared to your
10 experience with other companies, was it easier, about the same or more difficult to
11 contact Amazon's customer service?"⁶ Dr. Sabol summarized the results as follows:
12 "Overall, 94% responded that it was easier (73%) or about the same (21%) to contact
13 Amazon's customer service compared to other companies. Among In-App Purchasers,
14 97% responded that it was easier (74%) or about the same (23%) relative to other
15 companies."⁷

16
17
18 Given that Dr. Sabol's survey asked respondents about their actual experience
19 contacting Amazon's customer service and as compared to contacting other companies, it
20 is my opinion that the results of Dr. Sabol's survey are more reliable than the results in
21 this test regarding the task of contacting Amazon and the subjects' subjective perception
22 of that task.

23
24
25
26 ⁴ Expert Report of Barry A. Sabol, Ph.D. (December 7, 2015).

27 ⁵ Expert Report of Barry A. Sabol, Ph.D. (December 7, 2015) at 16.

⁶ Expert Report of Barry A. Sabol, Ph.D. (December 7, 2015) at 16-17.

⁷ Expert Report of Barry A. Sabol, Ph.D. (December 7, 2015) at 16.

Section 6: Conclusion

My opinion is that the Amazon notifications and purchase flows tested informed parents adequately about in-app purchases. The results of this usability test strongly support this opinion. The results are conclusive that the Kindle Fire user interfaces and email notifications should not have resulted in significant percentages of unwanted and non-refunded in-app purchases. The results of the usability test substantially undermine Ms. King's opinions that the Kindle Fire notices, user interfaces, and confirmatory email were "ineffective."⁸

When considering these results, it is important to balance the user protection that Amazon provides regarding in-app purchases with the needs of those who do desire to make in-app purchases. There are many pieces of information that Amazon needs to disclose to consumers at various phases in the purchase flow and the intricacies of how in-app purchasing works are not the most important information to convey. It would be inappropriate for in-app purchasing information to always be front and center on every screen, particularly given that the results of this study show in-app purchasing information to be clearly understood as currently presented.

Further, Amazon's ongoing intention to improve the in-app purchasing experience is evident. For example, the FTUX popup was changed in June 2014. It is important to note that the study results show that the both the May 2013 and June 2014 FTUX popups were

⁸ In my experience, a valid usability test is typically a superior way to evaluate a user interface than a usability inspection, particularly one performed by a single evaluator, as was done in Ms. King's report.

1 very well understood by the subjects of the experiment. It can be concluded from this
2 result that subjects well understood both the May 2013 and June 2014 FTUX.

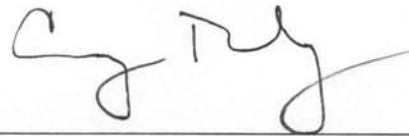
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5 Dated: Dec 7, 2015
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CRAIG ROSENBERG, PH.D.
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1 very well understood by the subjects of the experiment. It can be concluded from this
2 result that subjects well understood both the May 2013 and June 2014 FTUX.
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Appendix A: craigslist Ad

\$150 for Mobile Tablet Study

Are you interested in participating in a research study involving mobile table devices?

Global Technica invites parents and grandparents to participate in a study evaluating mobile tablet devices and interfaces.

The study will take place at the University of Washington. Your participation will involve interacting with a tablet and answering a questionnaire. It will take approximately 2 hours to complete.

Who can be part of this study?

- Adults over the age of 20 years old
- Must have at least one child or grandchild currently aged 13 or younger
- Fluent English speakers
- Comfortable using a tablet or smartphone

Compensation \$150

If interested, please register online at <http://goo.gl/forms/4oWws95Zzp>

or

Email: erika@globaltechnica.com

Appendix B: Screening Questions

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Register for the Study

Thank you for your interest in the Kindle usability study. Use this survey to share your contact information, so that one of our researchers can contact you.

First name

Last name

Gender

- ☐ Male
☐ Female

Primary phone number

E-mail

Do you have any children or grandchildren under 14 years old?

- ☐ Yes
☐ No

Age

Do you own an Amazon Kindle?

- ☐ Yes
☐ No

Please indicate the best days for us to contact you:

- ☐ Monday
☐ Tuesday
☐ Wednesday
☐ Thursday
☐ Friday
☐ Saturday
☐ Sunday

Please indicate the most convenient time for us to call:

- ☐ Morning: 9AM - 12PM
☐ Afternoon: 12PM - 6PM
☐ Evening: 6PM - 9PM

Submit

Never submit passwords through Google Forms.

Powered by
 Google Forms

This form was created inside of UW.
[Report Abuse](#) - [Terms of Service](#) - [Additional Terms](#)

Appendix C: Consent Form

CONSENT FORM

Mobile Tablet Usability Study

Researchers:

Craig Rosenberg (PI), Global Technica

Doug Wieringa, Global Technica

Erika Miller, Global Technica

PURPOSE OF THE STUDY

The purpose of this study is to evaluate mobile tablet interfaces.

STUDY PROCEDURES

Your involvement will consist of one visit lasting approximately 2 hours, which will take place in a conference room with up to eight other people.

You will be asked to interact with a computer and mobile tablet during the study. On the computer, you will be asked a series of questions about the tablet as well as computer-generated images. Your input will be collected using a survey, but we will not ask for your name on the survey. There are no right or wrong answers in the study.

Before dismissing you, the researcher will compensate you for your time.

BENEFITS AND RISKS

There are no anticipated physical or emotional risks to participants. No risk greater than those experienced in ordinary conversation is anticipated. You will receive \$150 after you complete all study procedures.

1 **CONFIDENTIALITY OF RESEARCH INFORMATION**

2 Unless ordered otherwise by a court, your confidentiality will be protected throughout the
3 experiment and evaluation, as well as in any subsequent reports. All findings used in any
4 written reports or publications that result from this study will be reported in aggregate
5 form with no identifying information.

6 For good and valuable consideration, including monetary payment received in exchange
7 for your participation in this research exercise, you agree not to in any way discuss,
8 disclose, or communicate that you participated in the study, the fact that the research is
9 taking place, the conduct of the research, the content of the materials provided during the
10 study, and the opinions and conclusions reached by the participants involved in the
11 research including your own, whether in discussions with family, friends, or third parties
12 (including any representatives of the media). You further agree that you will not publish
13 your knowledge of the research, including via posting any information learned in the
14 research in books, articles, or online resources such as websites, blogs, emails, any social-
15 media platforms or on social media in any form, including but not limited to Facebook,
16 Twitter, Instagram, Vine, Snapchat, or YouTube.

17
18
19 **OTHER INFORMATION**

20 Your participation in this evaluation is completely voluntary. You may refuse to
21 participate and you are free to withdraw from this study at any time.

22 If you agree to participate in this study, you will be compensated for your time and effort.
23 You will be given \$150 after you complete all study procedures.

24
25 **AUTHORIZATION**

26 By signing this consent form, you are indicating that you fully understand the above
27 information and agree to participate in this focus group.

Printed Name of the Participant _____

Signature of the Participant _____

Date _____

Appendix D: Facilitator Script

Note: Because of randomization of the experimental conditions, this script shows only one order in which the tasks were performed.

Experiment Checklist

Date:

Number of Subjects:

Username:

Experimenter:

Introduction

Hi my name is Erika and I am from Global Technica. You are here today because we are doing a usability study on mobile tablet interfaces. Your involvement today should take about 1 to 2 hours.

How many of you are familiar with using a Kindle Fire? All right, well we are going to do a series of tasks on a Kindle Fire. But I will guide you through the steps so it shouldn't be too challenging if you're unfamiliar with the interface.

1 We are going to be going through all the tasks as a group, so please don't jump ahead.
2 During the study, you are going to answer questions on the computer as you look at
3 various screens on the Fire tablet. I will tell you what screen you should be looking at,
4 but if you have any questions during the process please ask.
5

6 I am now handing out a copy of the consent form. It's fairly short, so I am going to
7 give you all a few minutes to read through it and answer any questions you may have.
8

9 Are there are questions I can answer? If you are still interested in being in the study,
10 then please go ahead and sign the consent form.
11

12 *(Collect consent form)*
13

14 **Getting Started**

15 Before we get started, here are a few things to keep in mind. During this study you
16 will be going through a series of questions prompted through the computer. I am going to
17 use this overhead projector to guide you through many of the steps. When you finish a
18 task, the computer will prompt you to stop. Anytime you see a stop sign or a navigation
19 screen; do not continue past these breaks in the tasks. Again, please do not continue
20 forward until I tell you to.
21

22 Also remember that this is not a race. Please read through the questions carefully and
23 consider your responses. Please do not look at the computer screen for the person sitting
24 next to you. Others may or may not have the same number or order of questions as you,
25 so please do not base your progress off others. Lastly, there are no right or wrong answers
26 to these questions, just answer as you see appropriate.
27

1 *Login to Quest Track Website for Each Subject*

2

3 <http://qtsandbox.knowledgeanywhere.com/Enterprise>

4

5

Task 0

6

7

8 All right, we are ready to get going. First off we are going to take a preliminary
9 survey. I am going to log into the computer for each of you.

10

11 *(set up computer, survey screen)*

12

13 Please launch “Kindle Study: Task 0 (Survey)” on the computer. A popup window
14 should appear. Please make sure you expand the window so it takes up your entire screen.

15 Did everyone find how to make the window take up the entire screen?

16

17 You can now fill out the questions. When you are finished please just wait until the
18 whole group is ready.

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Task 1

Overview:

1.1. No IAP - Jeweled Bricks

1.2. IAP – Jump Racer

1.2.7 PLEASE NOTE (read more)

1.2.8 Key Details + Popup (scroll down)

Order A:

1.1; 1.2; 1.2.7; 1.2.8

Note that because of randomization of the experimental conditions, this order above only shows only one order in which the tasks were performed.

Instructions:

1. Now that everyone has had a chance to finish the survey. Please close the popup window. And your screen should look similar to mine.
2. (navigate to Kindle Study: Task 1) use PPT
3. Remember to expand the popup window so it takes up your entire screen. And your computer should now look like mine.
4. (stop sign) > proceed
5. Select Task 1.1
6. (stop sign)
7. Now if you could focus your attention on the Kindle Fire in front of you. Please pick it up and we are going to navigate through it together.

- 1 8. For this task, we are going to navigate to the App store and look at the description
- 2 pages for some apps. Imagine you are going to the App store to look for an app for
- 3 your child or grandchild.
- 4 9. Steps to get to “Jeweled Bricks”
- 5 10. Do not play or download the game.
- 6 11. Now does everyone’s Kindle Fire show this screen? If it does not, please raise your
- 7 hand.
- 8 12. For this task, you have now navigated to the app store and selected the app “Jeweled
- 9 Bricks.” When you click next on the computer you will be asked a series of questions
- 10 regarding the app description page you see on your Kindle Fire. You will notice on
- 11 the computer a small version of the Kindle Fire screen has been provided. Please do
- 12 not answer the questions by trying to read the screenshot on the computer, but please
- 13 focus on the Kindle Fire. The screenshot is merely provided for you so that you can
- 14 verify you are looking at the correct content.
- 15 13. Remember, this is not a race. Please answer thoughtfully. The people next to you
- 16 may or may not have the same questions as you, so don’t worry about their progress.
- 17 14. Now go ahead you can begin and answer the questions through this task and stop
- 18 when you get back to the navigation page, which I will display on the screen in a few
- 19 minutes.
- 20 15. Alright we are now going to select Task 1.2
- 21 16. (stop sign)
- 22 17. Navigate to “Jump Racer”
- 23
- 24
- 25
- 26
- 27

- 1 18. Similar to before, you have now navigated to the app description page in the app
2 store for the app “Jump Racer”. Please answer the following questions regarding the
3 content you see on your Kindle Fire. Again, do not try to read the small screenshots
4 provided on the computer.
- 5 19. Stop when you get to the next stopping point.
- 6 20. (stop sign)
- 7 21. We are now going to select Task 1.2.7
- 8 22. (stop sign)
- 9 23. If you haven’t already done so on your Kindle Fire, please tap the Read More link on
10 the left of the page. I’m directing your attention to the bottom of the text starting with
11 the capital letters PLEASE NOTE
- 12 24. Raise your hand if you do not see this.
- 13 25. Click next on your computer and answer the following question or questions.
- 14 26. We are now going to do Task 1.2.8
- 15 27. (stop sign)
- 16 28. For this task, please focus your attention on the Kindle Fire again.
- 17 29. Please direct your attention to the “Key Details” section on the screen, which should
18 be on the right side.
- 19 30. Is there anyone that does not see “Key details” on their screen?
- 20 31. Okay, please proceed through the following questions relating to this Key Details
21 section.
- 22 32. (stop sign)
- 23 33. Please press on “Key Details” on the right side of the screen.
- 24
- 25
- 26
- 27

- 1 34. This popup window should appear. Does everyone see it?
- 2 35. Please use your finger to scroll down. And you will see the section In-App
- 3 Purchasing.
- 4 36. Please proceed through the questions on the computer, referencing this screen you
- 5 see on your Kindle Fire.
- 6
- 7
- 8

9 Task 2

10 Overview:

11

12 2.1 May 2013 Screenshot

13

14 2.2 June 2014 Screenshot

15 Order A:

16

17 2.1; 2.2

18 Instructions:

- 19
- 20 1. Go through PowerPoint to navigate to survey
- 21 2. (stop sign after selecting Task 2.1)
- 22 3. Please hand your Kindle Fire to me and I am going to load an image.
- 23 4. Please do not turn over your Fire tablet yet.
- 24 5. For this task, you have a Fire tablet, which has been placed face down in front of you
- 25 and an account password, which is simply the word “password.” Imagine that you
- 26 have given your Fire tablet to your child or grandchild, who has been playing a game
- 27

1 app on the tablet. Your child hands you the tablet. When I instruct you to do so, click
2 'Next' on the computer screen, turn your Fire tablet over and read the information
3 displayed on the screen. When you are done reading the information on the screen,
4 enter your password on the computer and click Submit. This is neither a race nor a
5 memory test. Please read the information on the screen at the pace you would if your
6 child or grandchild had just handed you the device.
7

8 6. (*charades, slow*) Just to repeat, When I instruct you to do so, click 'NEXT on the
9 computer screen, turn your Fire tablet over and read the information displayed on the
10 screen. When you are done reading the information on the screen, enter the word
11 'password' on the computer and click 'Submit.' Whenever you are ready, you may
12 click 'Next' and proceed."
13

14 7. (*stop sign*)

15 8. You may now resume looking at the tablet displaying the same page you just saw.
16 Click 'Next' on your computer and answer the following questions about that page.
17 Remember it is not a race. Your screens may or may not be the same as the person
18 next to you, so don't base your progress off others.

19 9. PowerPoint to show select 2.2

20 10. Please hand Kindle Fire back to me.

21 11. Do not turn over the tablet yet.

22 12. Repeat Step 4 and 5.
23
24
25
26
27

Task 3

Overview:

- 3.1 Email Notification (split screen)
- 3.2 Refund Plan (split screen)
- 3.3 Contact Amazon (minimize survey)

Instructions:

1. For this task, I am going to set up your computer for you. (dual screen email and survey)
2. You are now looking at two windows. One is the survey. The other is an email. Note that the email can be scrolled down to view more content.
3. For this task, imagine that your child or grandchild has been playing with your Fire tablet. At some point, you check your email and see that you have received the email that is displayed on the left of your computer screen. Whenever you are ready, click Next on the right side of your computer and answer the following questions about the email. Remember, this is neither a memory test nor a race.
4. Imagine that the product identified in the email was never purchased or was accidentally purchased by you, your child, or your grandchild and that you would like to seek a refund from Amazon for the charge. Click Next on the right side of your computer and answer the questions about contacting Amazon.
5. For this task, we are going to actually try to contact Amazon just as you would in real life. When I instruct you to do so, please try to contact Amazon to seek a refund for

1 the product identified in the email that you believe was never purchased or was
2 accidentally purchased by you, your child, or your grandchild. The tools you have
3 available to contact Amazon include the computer in front of you, which has access
4 to the Internet.

5 If you would like to use the Internet, you may click on the Internet Explorer icon
6 or the Google Chrome Icon located at the bottom of the computer. You also have
7 your Fire tablet, which has access to the Internet using the Silk Browser. You also
8 have a telephone by which you may call Amazon. And you have the confirmation
9 email identifying the product for which you seek a refund. If you need them, your
10 account email address and password will be provided on the following slide.

11
12 6. Remember, this is neither a memory test nor a race. Imagine that you have actually
13 received this email and want to seek a refund from Amazon for the product identified
14 in the email. How will you do so? Whenever you are ready, please begin.

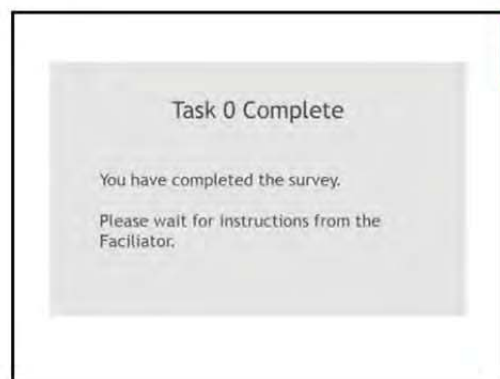
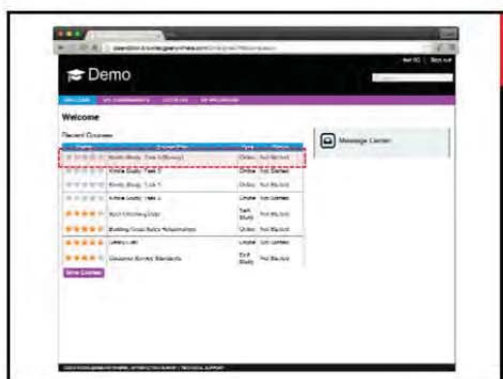
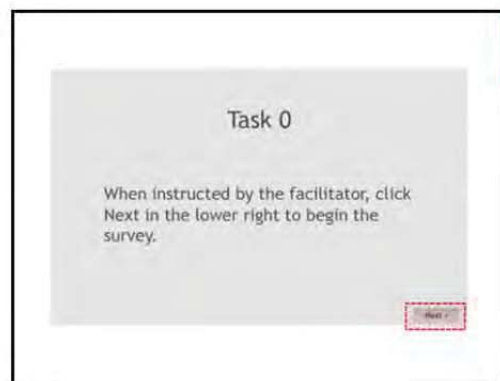
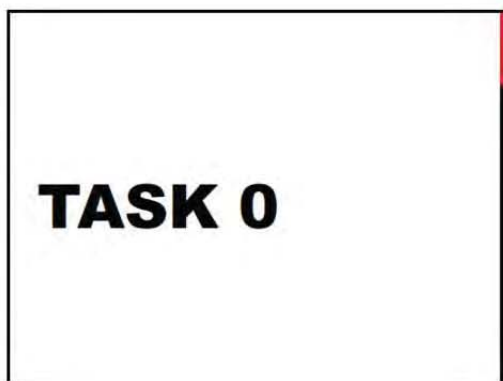
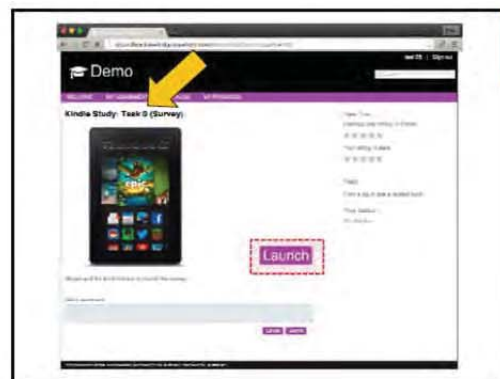
15
16 7. *(Stop people when they are finished)*

17 18 **Debrief**

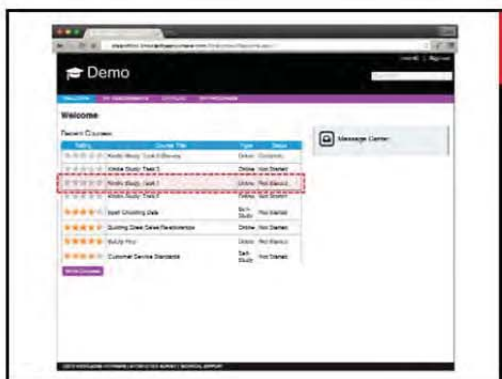
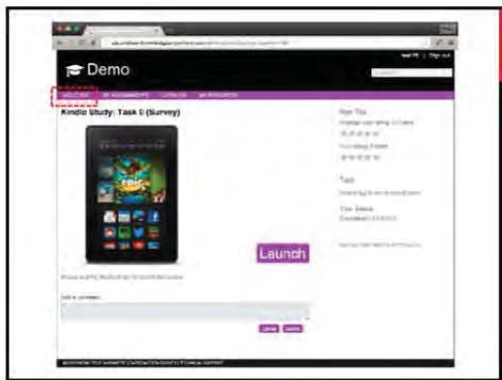
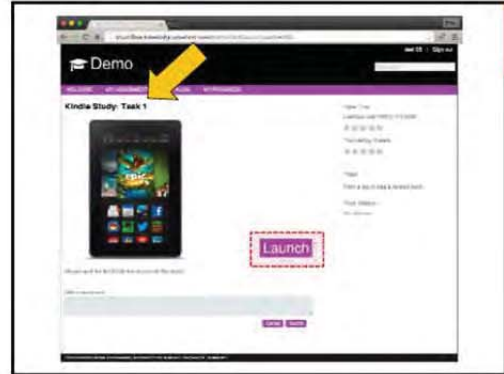
19 We are now finished with the study. Just for your interest, the purpose of this study
20 was to evaluate the Amazon interfaces specifically regarding in-app purchases.

21
22 I am now going to give each of you \$150 and then you will be free to go. Thank you
23 again very much for your time and effort.
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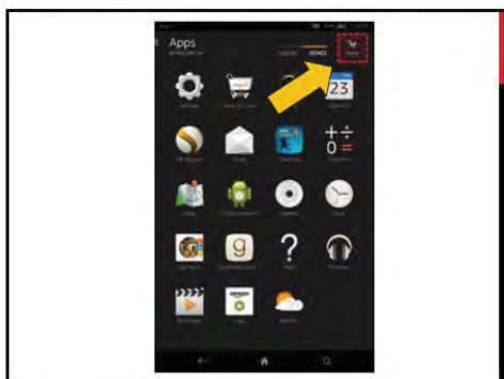
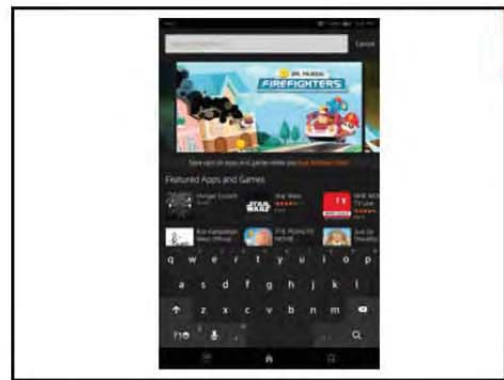
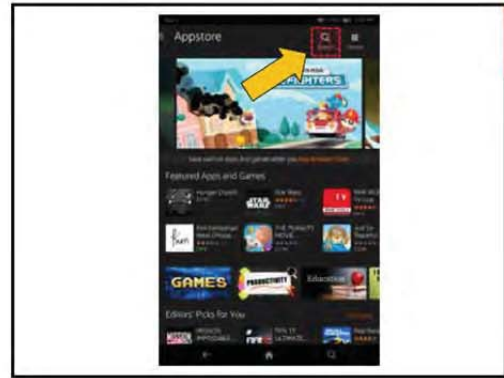
Appendix E: Facilitator's Visual Aid

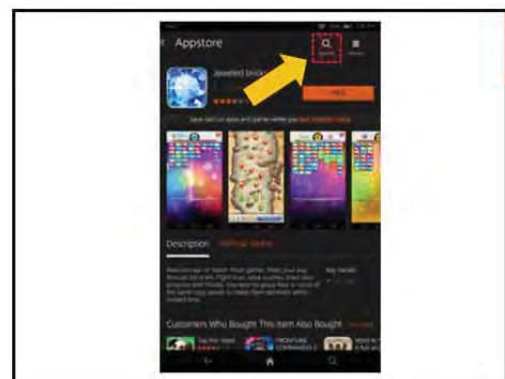
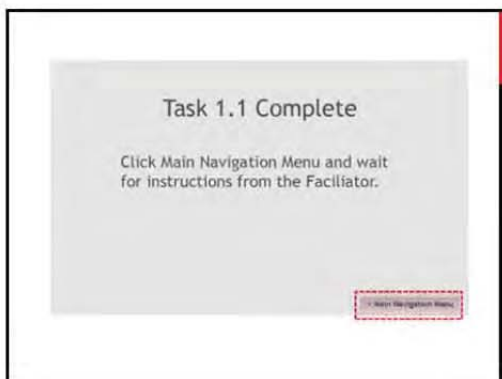
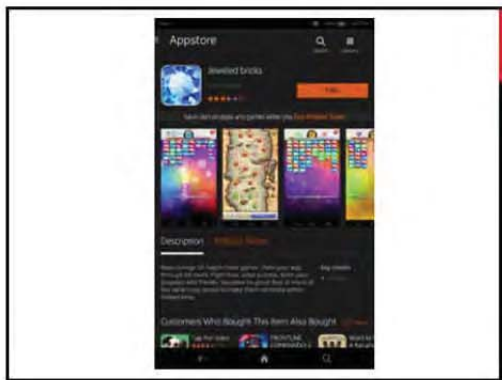
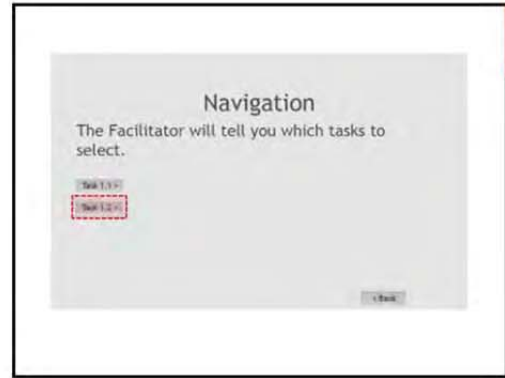


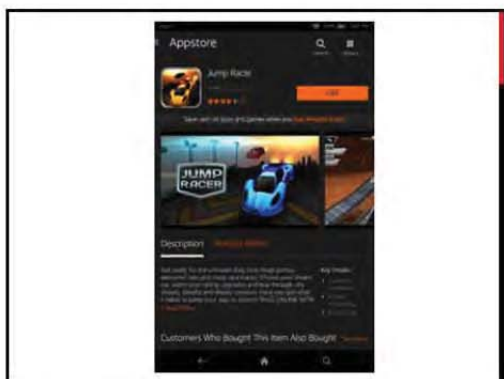
TASK 1

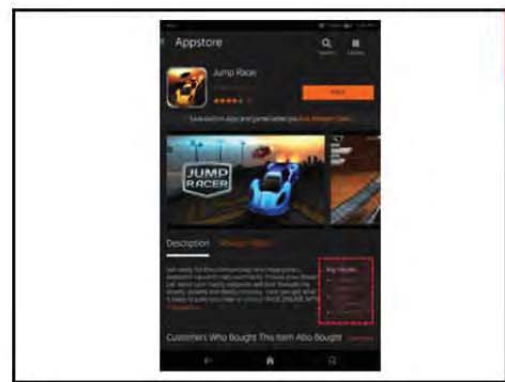
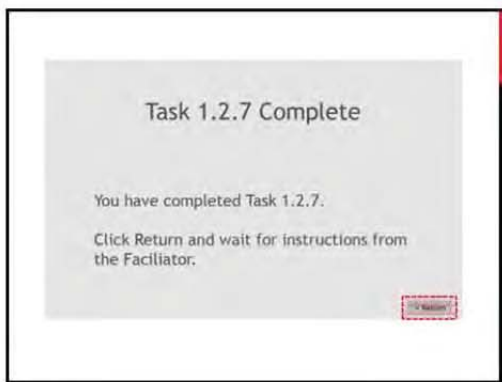


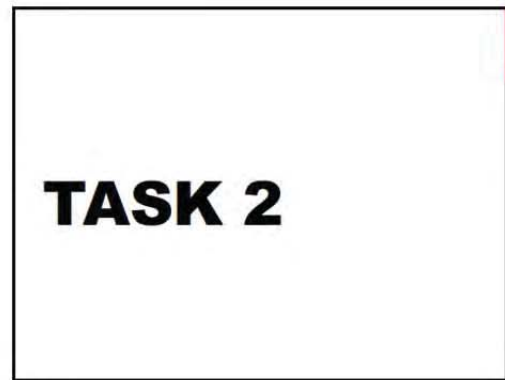
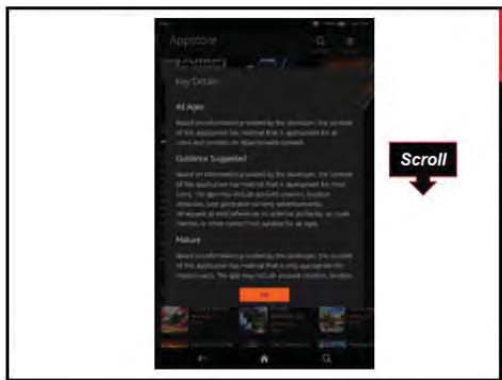
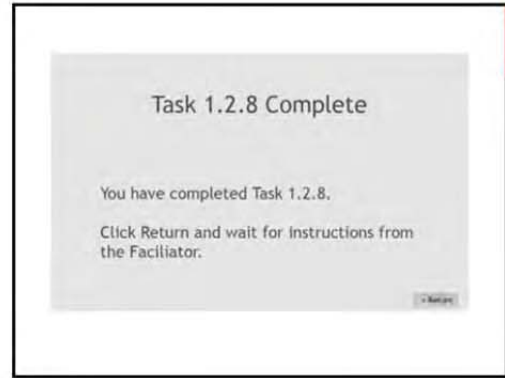
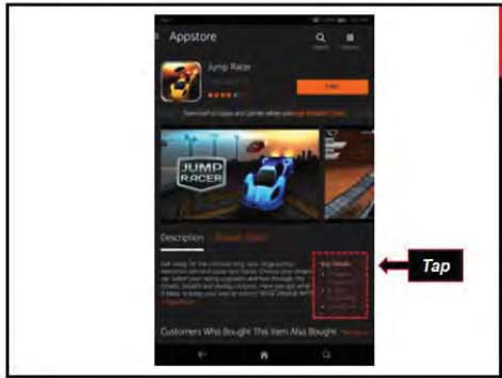
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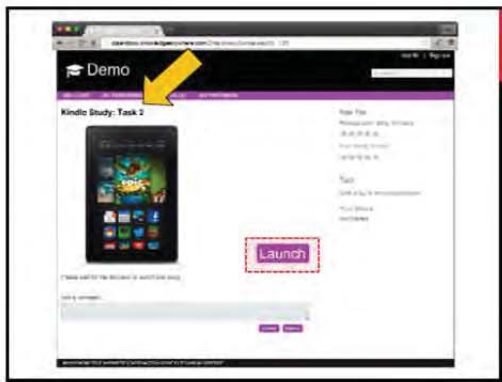
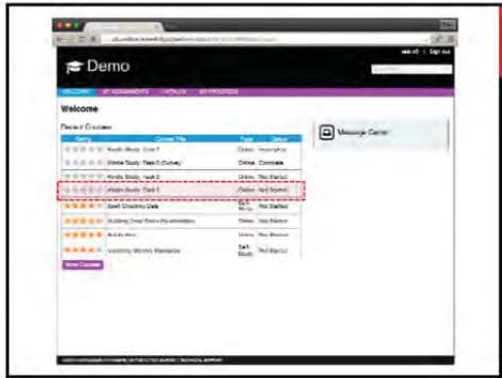




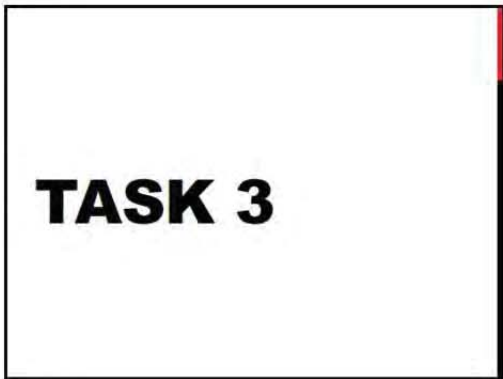
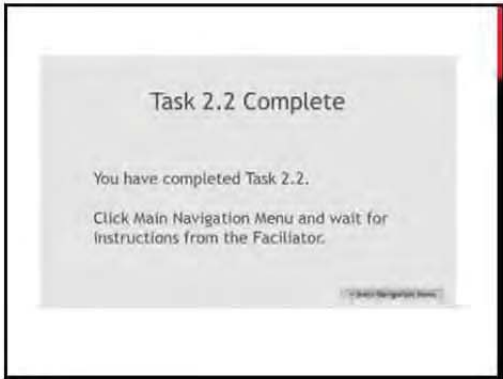
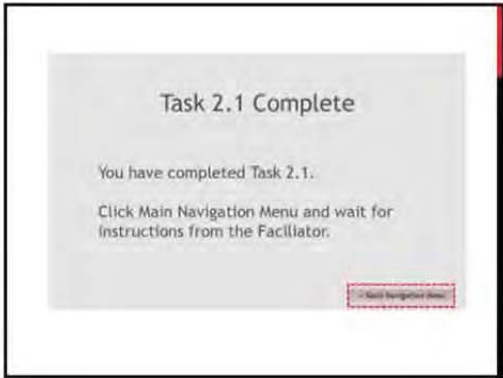


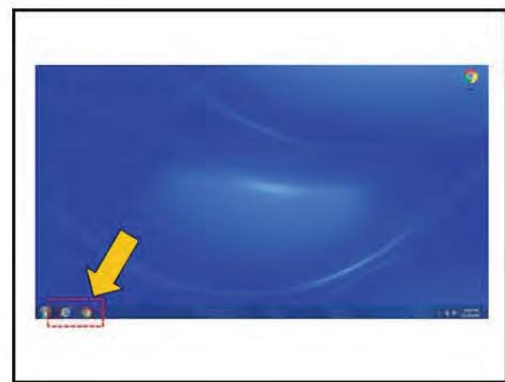
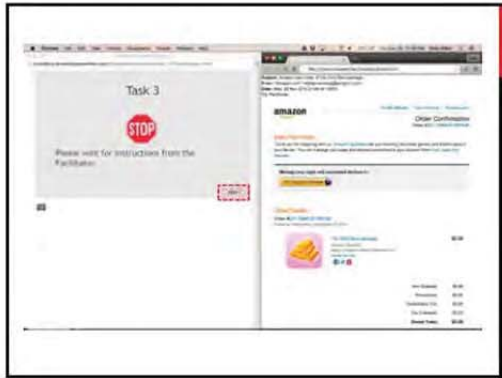






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AMAZON ACCOUNT

Amazon Username:

doug@globaltechnica.com

Amazon Password:

gtkindle

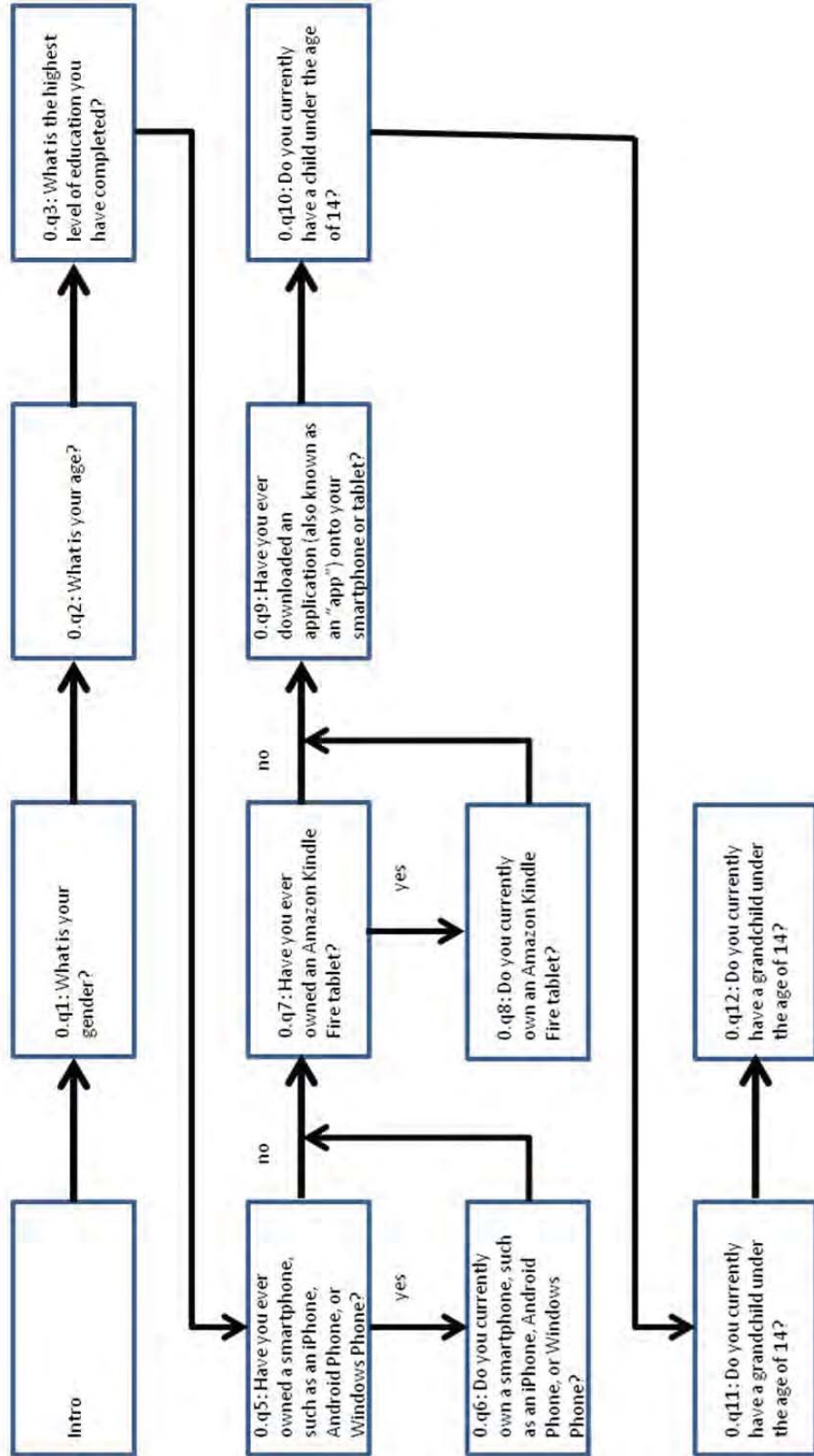
MOBILE TABLET STUDY

THANK YOU FOR YOUR PARTICIPATION

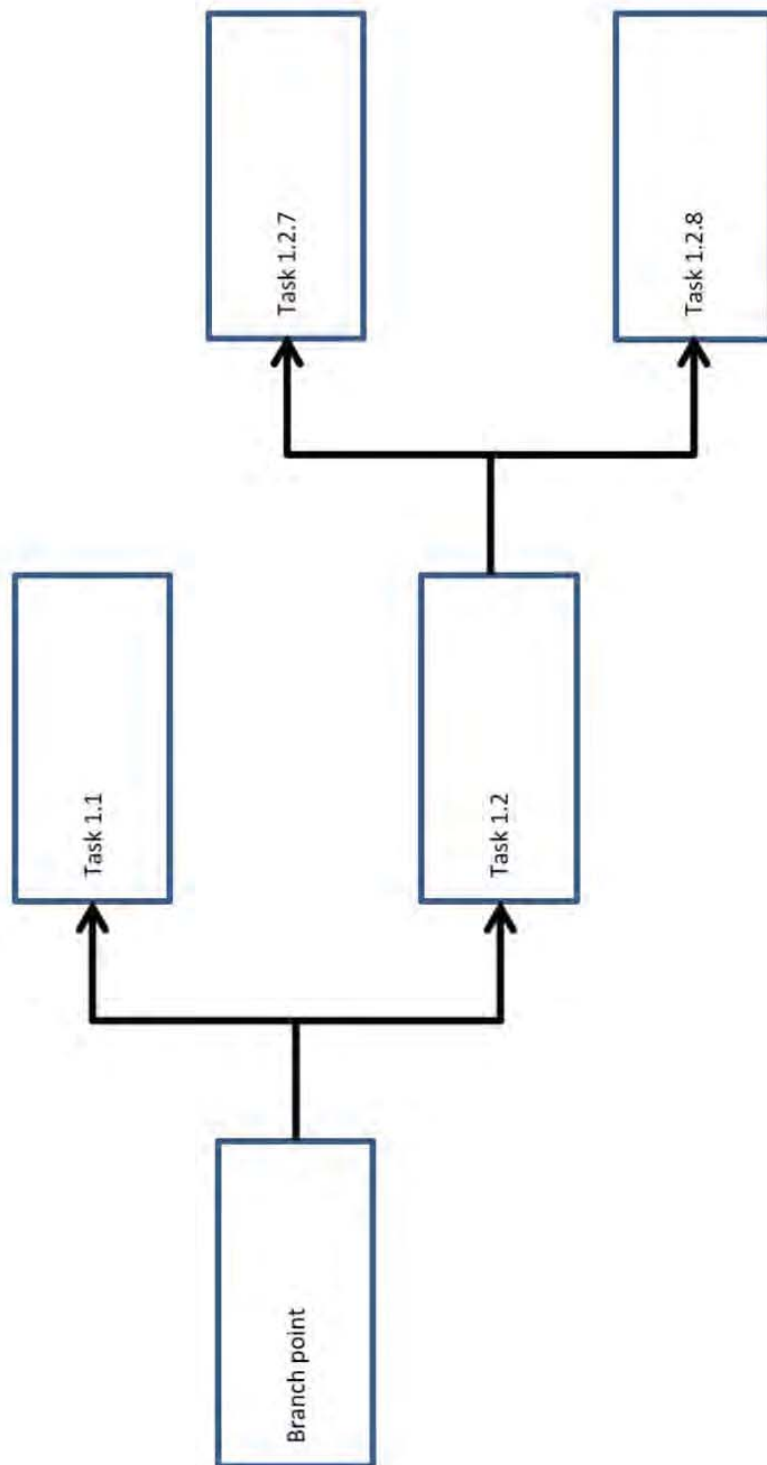


Appendix F: Task Flow

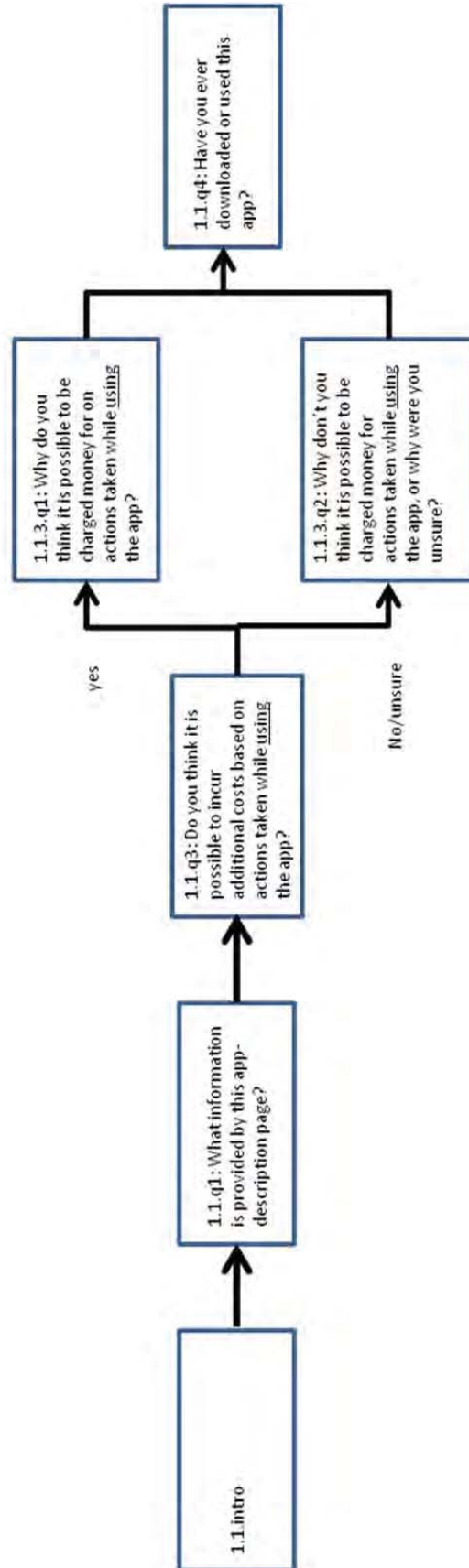
Task 0: Survey



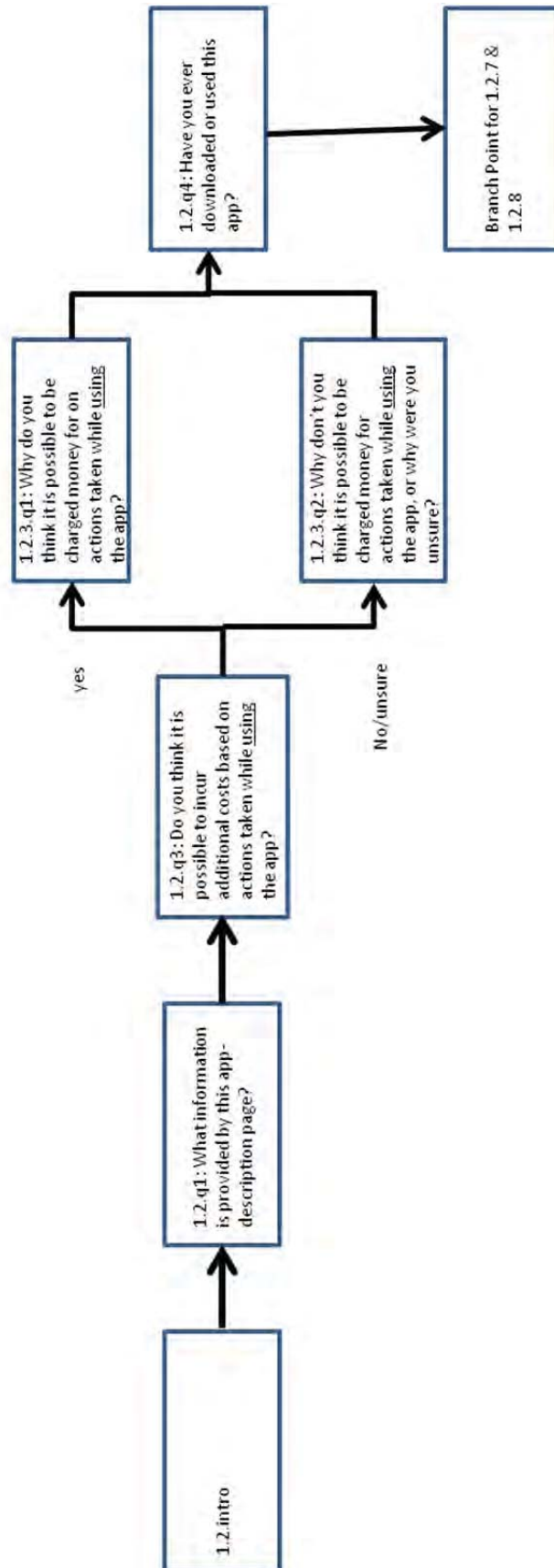
Task 1 Overview



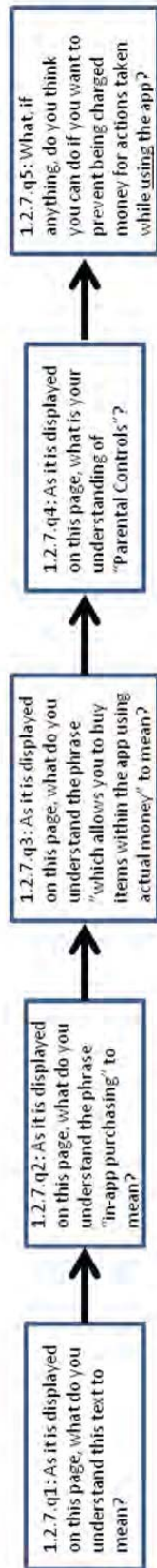
Task 1.1



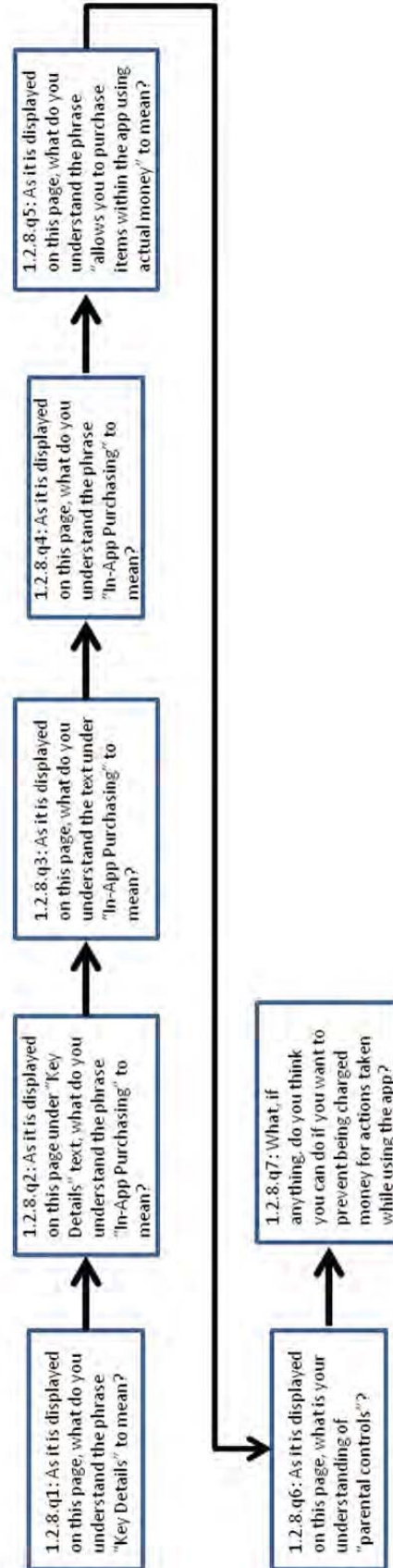
Task 1.2



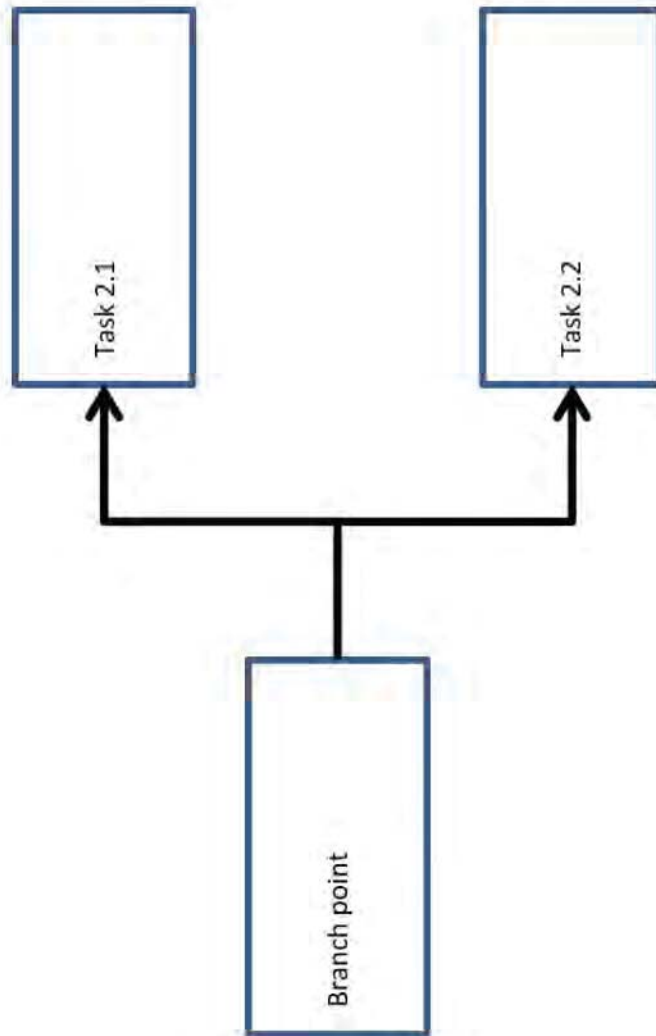
Task 1.2.7



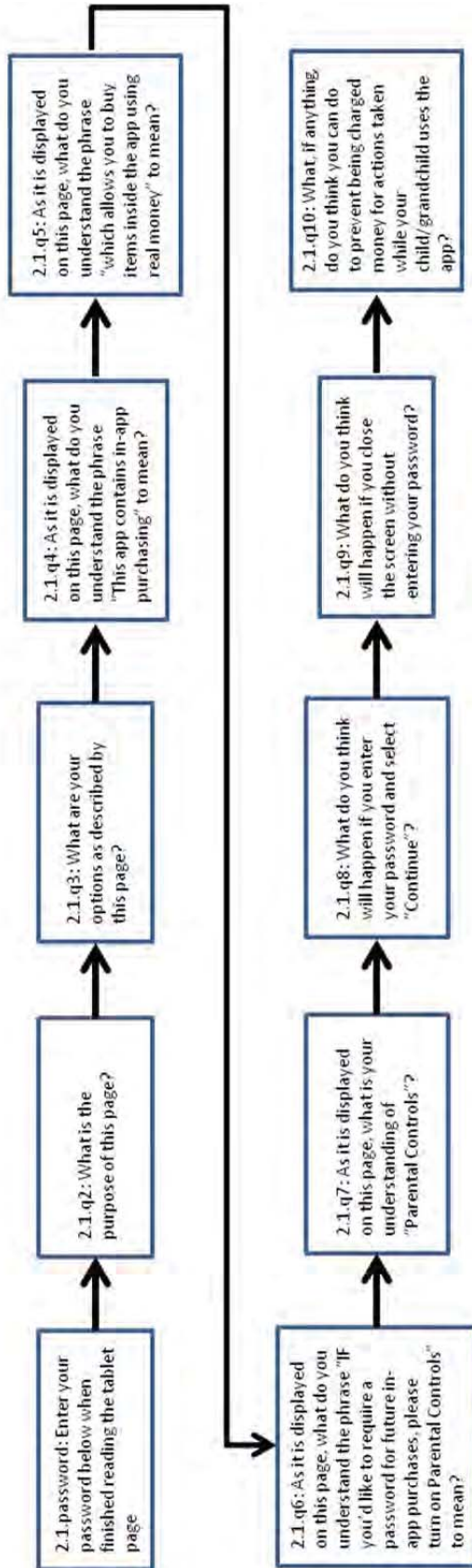
Task 1.2.8



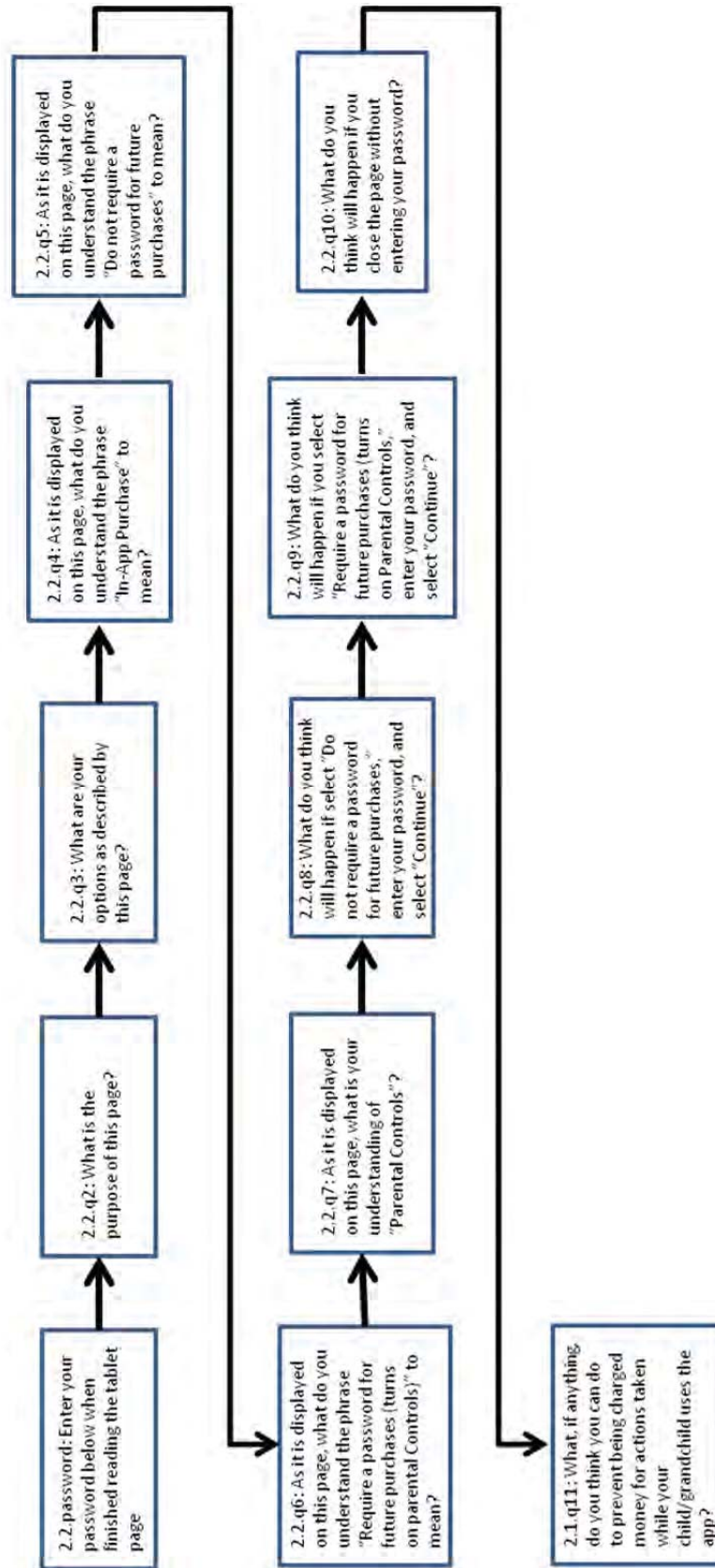
Task 2 Overview



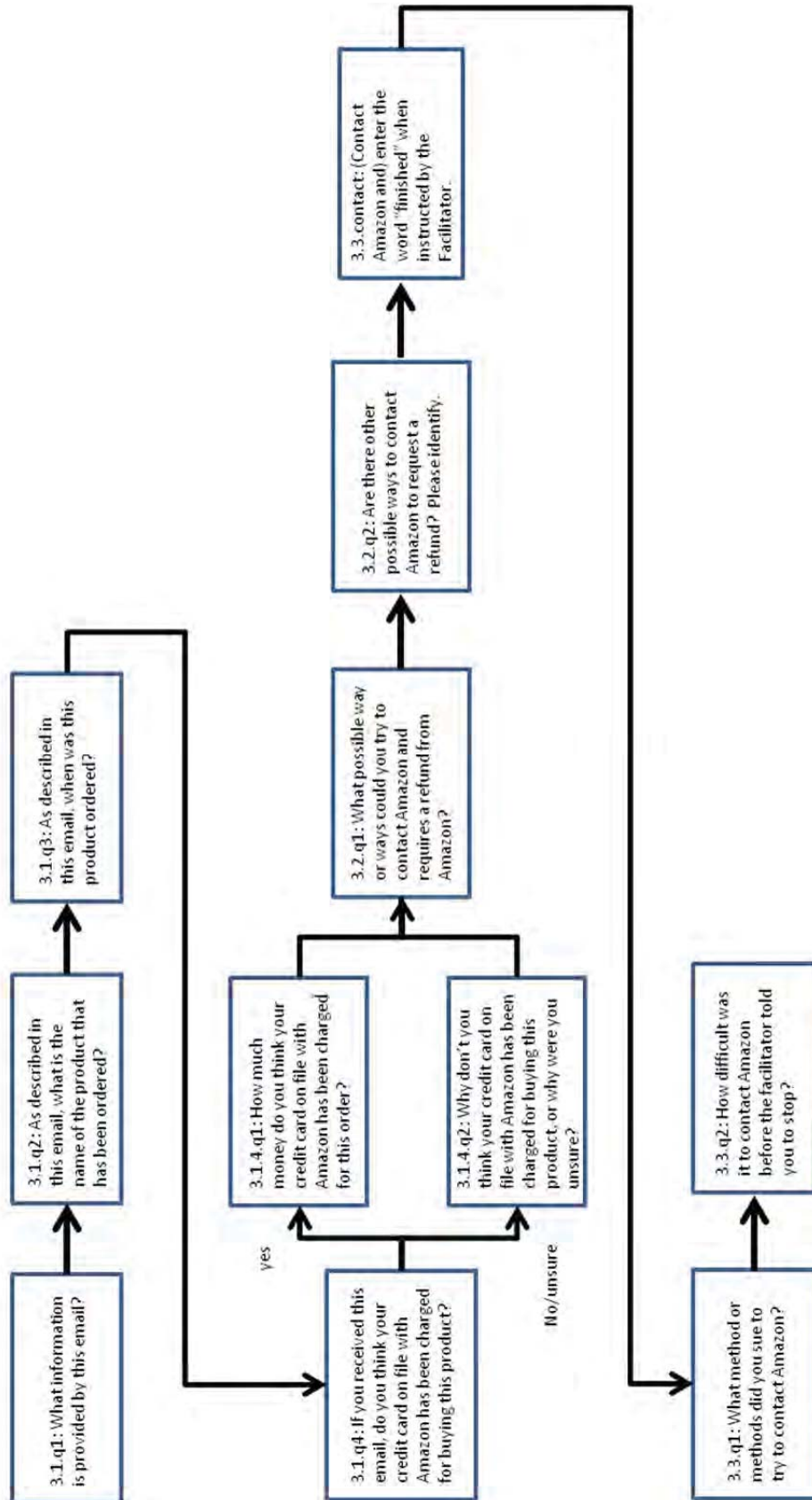
Task 2.1



Task 2.2



Task 3



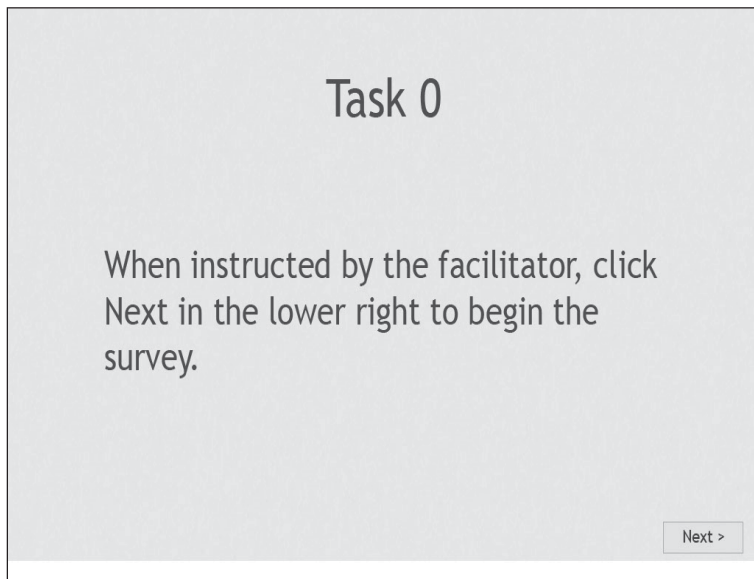
Appendix G: Survey Screenshots

This appendix presents Captivate storyboards showing the survey questions.

Note that the box marked Review Area is not visible to survey participants. Note also that because of branching and randomization subjects did not necessarily view slides in the order shown here.

Task 0

Slide1



Slide2

[0.q1]
What is your gender?

☒ Male
☐ Female

Review Area

Review Area

Question 1 of 12

Submit

Slide3

[0.q2]
What is your age?

☒ 20 - 29
☐ 30 - 39
☐ 40 - 49
☐ 50 - 59
☐ 60 - 69
☐ 70 or older

Review Area

Review Area

Question 2 of 12

Submit

Slide4

[0.q3]
What is the highest level of education you have completed?

- ☒ Some high school
- ☐ High school
- ☐ Some college
- ☐ Associate degree
- ☐ Bachelor's degree
- ☐ Graduate degree

Review Area

Review Area

Question 3 of 12

Submit

Slide5

[0.q4]
What is your current occupation?

255-character limit

Review Area

Question 4 of 12

Submit

Slide6

[0.q5]

Have you ever owned a smartphone, such as an iPhone, Android Phone, or Windows Phone?

☒ Yes

☐ No

Review Area

Review Area

Question 5 of 12

Submit

Slide7

[0.q6]

Do you currently own a smartphone, such as an iPhone, Android Phone, or Windows Phone?

☒ Yes

☐ No

Review Area

Review Area

Question 6 of 12

Submit

1 **Slide8**

2 {0-q7}

3 Have you ever owned an

4 Amazon Kindle Fire tablet?

5 ☒ Yes

6 ☐ No

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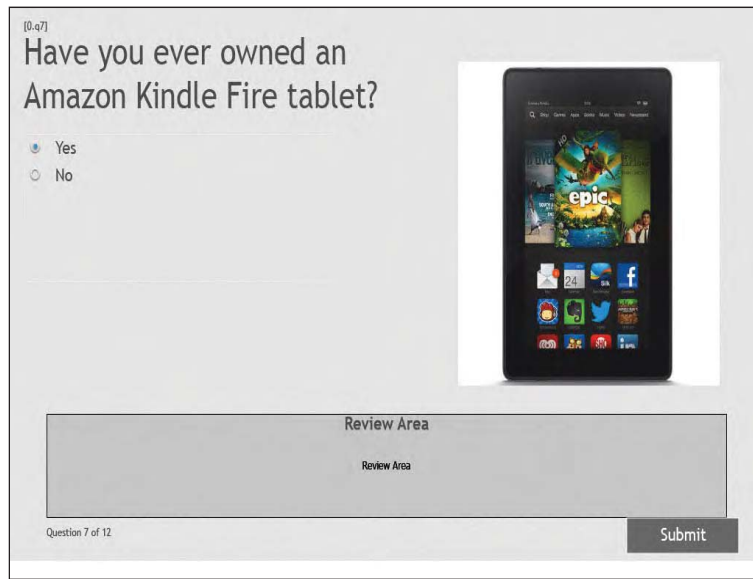
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The screenshot shows a survey interface for Question 7 of 12. The question is "Have you ever owned an Amazon Kindle Fire tablet?". There are two radio button options: "Yes" (which is selected) and "No". To the right of the question is an image of an Amazon Kindle Fire tablet displaying the "epic" app. Below the question and options is a large gray rectangular area labeled "Review Area". At the bottom left of the slide is the text "Question 7 of 12", and at the bottom right is a "Submit" button.

12 **Slide9**

13 {0-q8}

14 Do you currently own an

15 Amazon Kindle Fire tablet?

16 ☒ Yes

17 ☐ No

18

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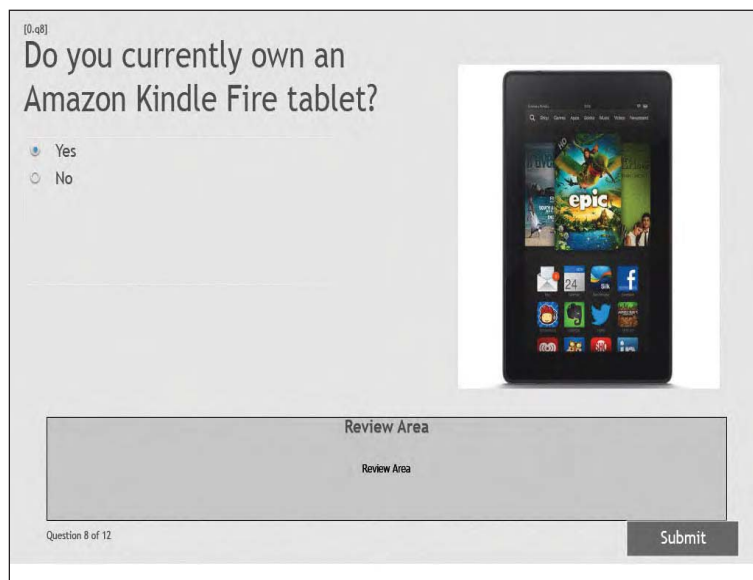
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The screenshot shows a survey interface for Question 8 of 12. The question is "Do you currently own an Amazon Kindle Fire tablet?". There are two radio button options: "Yes" (which is selected) and "No". To the right of the question is an image of an Amazon Kindle Fire tablet displaying the "epic" app. Below the question and options is a large gray rectangular area labeled "Review Area". At the bottom left of the slide is the text "Question 8 of 12", and at the bottom right is a "Submit" button.

1 **Slide10**

2 [0..9]

3 Have you ever downloaded an application

4 (also known as an “app”) onto your

5 smartphone or tablet?

6 ☒ Yes

7 ☐ No

8

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Review Area

Review Area

Question 9 of 12

Submit

12 **Slide11**

13 [0..10]

14 Do you currently have a child under the age

15 of 14?

16 ☒ Yes

17 ☐ No

18

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Review Area

Review Area

Question 10 of 12

Submit

1 **Slide12**

2 [0.q11]

3 Do you currently have a grandchild under

4 the age of 14?

5 ☒ Yes

6 ☐ No

7

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Review Area

Review Area

Question 11 of 12

Submit

12 **Slide13**

13 [0.q12]

14 If you have a child and/or grandchild under

15 the age of 14, what is their age?

16

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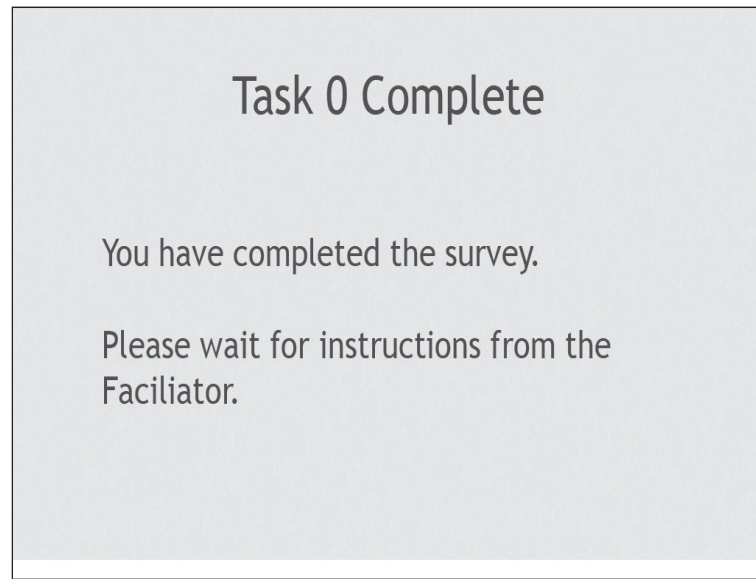
255-character limit

Review Area

Question 12 of 12

Submit

1 **Slide14**



12 **Task 1**

13

14 **Slide1**



Slide2

Navigation

The Facilitator will tell you which tasks to select.


Task 1.1 >

Task 1.2 >

< Back

Slide3

Task 1.1




Please wait for instructions from the Facilitator.

< Back Next >

Slide4

[1.1.q1]
What information is provided by this app-description page?



Review Area


Question 1 of 22

Submit

Slide5

[1.1.q3]
Do you think it is possible to incur additional costs based on actions taken while using the app?

☒ Yes
☐ No
☐ Unsure



Review Area
Review Area

Question 2 of 22

Submit

Slide6

[1.1.3.q1]

Why do you think it is possible to be charged money for on actions taken while using the app?

255-character limit



Review Area

Question 3 of 22

Submit

Slide7

[1.1.3.q2]

Why don't you think it is possible to be charged money for actions taken while using the app, or why were you unsure?

255-character limit



Review Area


Question 4 of 22

Submit

Slide8

[1.1.q4]
Have you ever downloaded or used this app?

☒ Yes
☐ No



Review Area
Review Area

Question 5 of 22

Submit

Slide9

Task 1.1 Complete

Click Main Navigation Menu and wait
for instructions from the Faciliator.

< Main Navigation Menu

Slide10

Task 1.2




Please wait for instructions from the facilitator.

< Back Next >

Slide11

[1.2.q1]
What information is provided by this app-description page?

255-character limit



Review Area


Question 6 of 22 Submit

Slide12

[1.2.q3]

Do you think it is possible to incur additional costs based on actions taken while using the app?

☒ Yes
☐ No
☐ Unsure



Review Area

Review Area

Question 7 of 22


Submit

Slide13

[1.2.3.a1]

Why do you think it is possible to be charged money for actions taken while using the app?

255-character limit



Review Area

Question 8 of 22

Submit

Slide14

[1.2.3.q2]


Why don't you think it is possible to be charged money for actions taken while using the app, or why were you unsure?

255-character limit

Review Area

Question 9 of 22

Submit



Slide15

[1.2.q4]

Have you ever downloaded or used this app?


☒ Yes

☐ No

Review Area

Question 10 of 22

Submit



Slide16

Navigation



The facilitator will tell you which button to click.

Task 1.2.7 >

Task 1.2.8 >

< Main Navigation Menu

Slide17



Please wait for instructions from the facilitator.

< Back Next >

Slide18

[1.2.7.q1]

As it is displayed on this page, what do you understand this text to mean?

255-character limit



Review Area

Question 11 of 22

Submit

Slide19

[1.2.7.q2]

As it is displayed on this page, what do you understand the phrase “in-app purchasing” to mean?

255-character limit



Review Area

Question 12 of 22

Submit

Slide20

[1.2.7.q3]

As it is displayed on this page, what do you understand the phrase “which allows you to buy items within the app using actual money” to mean?



255-character limit

Review Area

Question 13 of 22

Submit

Slide21

[1.2.7.q4]

As it is displayed on this page, what is your understanding of “Parental Controls”?



255-character limit

Review Area

Question 14 of 22

Submit

Slide22

[1.2.7.q5]


What, if anything, do you think you can do if you want to prevent being charged money for actions taken while using the app?

255-character limit

Return Area

Question 15 of 22

Submit



Slide23

Task 1.2.7 Complete

You have completed Task 1.2.7.

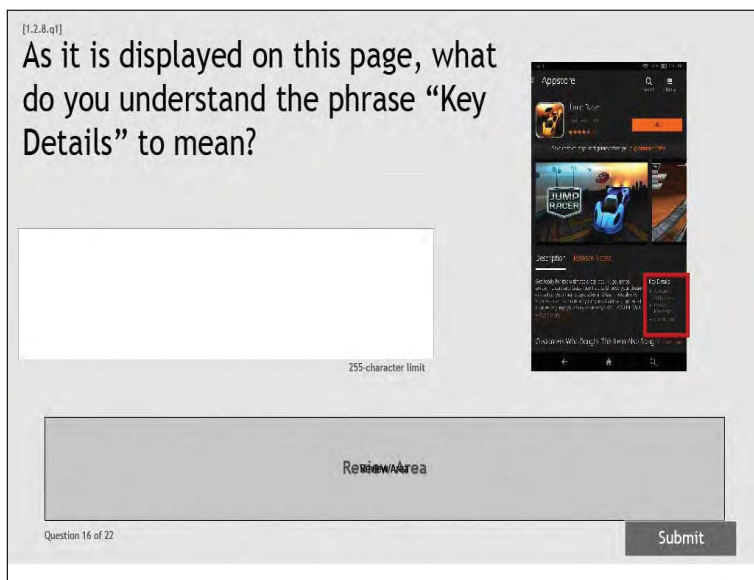
Click Return and wait for instructions from the Faciliator.

< Return

Slide24



Slide25



Slide26

[1.2.8.q2]


As it is displayed on this page under the “Key Details” text, what do you understand the phrase “In-App Purchasing” to mean?

255-character limit

Review Area

Question 17 of 22

Submit



Slide27



Please wait for instructions from the Facilitator.

< Back Next >

Slide28

[1.2.8.q3]


As it is displayed on this page, what do you understand the text under “In-App Purchasing” to mean?

255-character limit

RenewArea

Question 18 of 22

Submit



Slide29

[1.2.8.q4]


As it is displayed on this page, what do you understand the phrase “In-App Purchasing” to mean?

255-character limit

RenewArea

Question 19 of 22

Submit



Slide30

[1.2.8.q5]


As it is displayed on this page, what do you understand the phrase “allows you to purchase items within the app using actual money” to mean?

255-character limit

Review Area

Question 20 of 22

Submit



Slide31

[1.2.8.q6]


As it is displayed on this page, what is your understanding of “parental controls”?

255-character limit

Review Area

Question 21 of 22

Submit



Slide32

[1.2.8.a7]


What, if anything, do you think you can do if you want to prevent being charged money for actions taken while using the app?

255-character limit

Remove

Question 22 of 22

Submit



Slide33

Task 1.2.8 Complete

You have completed Task 1.2.8.

Click Return and wait for instructions from the Faciliator.

< Return

Slide34

Task 1.2 Complete

You have completed Task 1.2.

Click Return and wait for instructions from the Faciliator.

< Return

Task 2

Slide1

Task 2

When instructed by the facilitator, click Next in the lower right to begin Task 2.

Next >

Slide2

Navigation

The facilitator will tell you which button to click.

Task 2.1 >

Task 2.2 >

Slide3

Task 2.1



Please wait for instructions from the facilitator.

< Back Next >

Slide4


[2.1.password]
Your password is "password". Enter your password below when finished reading the tablet page.

Password:

Review Area

Question 1 of 21

Slide5



Please wait for instructions from the facilitator.

Slide6

[2.1.q2]
What is the purpose of this page?

255-character limit

Submit

Question 2 of 21

Slide7

[2.1.q3]
What are your options as described by this page?

255-character limit

Submit

Question 3 of 21

Slide8

[2.1.44]


As it is displayed on this page, what do you understand the phrase “This app contains in-app purchasing” to mean?

255-character limit

Review Area

Question 4 of 21

Submit



Slide9

[2.1.45]

As it is displayed on this page, what do you understand the phrase “which allows you to buy items inside the app using real money” to mean?

255-character limit

Review Area

Question 5 of 21

Submit



Slide10

[2.1.q6]

As it is displayed on this page, what do you understand the phrase “If you’d like to require a password for future in-app purchases, please turn on Parental Controls” to mean?

255-character limit

Review Area

Question 6 of 21

Submit

Slide11

[2.1.q7]

As it is displayed on this page, what is your understanding of “Parental Controls”?

255-character limit

Review Area

Question 7 of 21

Submit

[2.1.q8]

What do you think will happen if you enter your password and select “Continue”?

255-character limit

Continue to Allow Password

0

Enter your current password to allow a new password.
You will not be able to log in until you confirm your password by typing it again below.
Password

Continue to Allow Password

Enter a New Password
Enter a New Password
Confirm Password
Continue to Allow Password

Review Area

Submit

Question 8 of 21

[2.1.49]

What do you think will happen if you close the screen without entering your password?

255-character limit

Submit to Quiz Platform

You have submitted a quiz containing 4 questions and achieved a score of 0% (0/4) correct.

If you click on a question, you can view the answer.

Submit

You are able to reattempt questions for some types of quizzes, subject to our Terms & Conditions.

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Review Area

Question 9 of 21

Submit

Slide14

[2.1.q10]

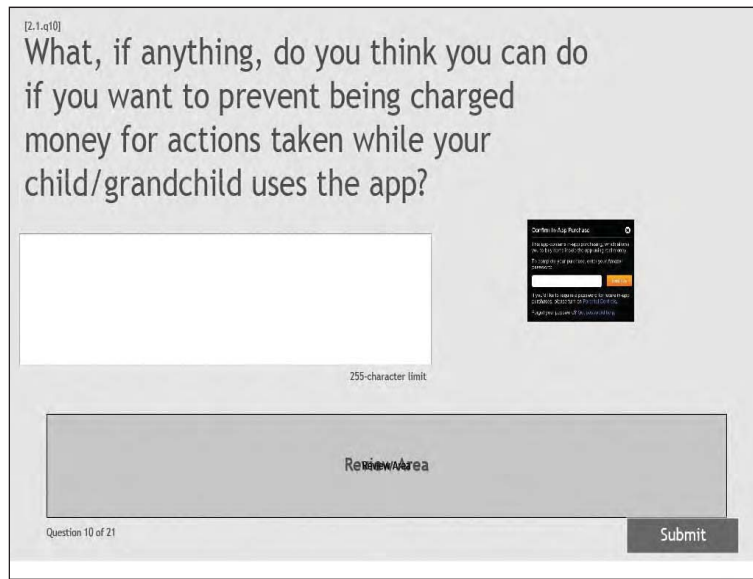
What, if anything, do you think you can do if you want to prevent being charged money for actions taken while your child/grandchild uses the app?

255-character limit

Review Area

Question 10 of 21

Submit



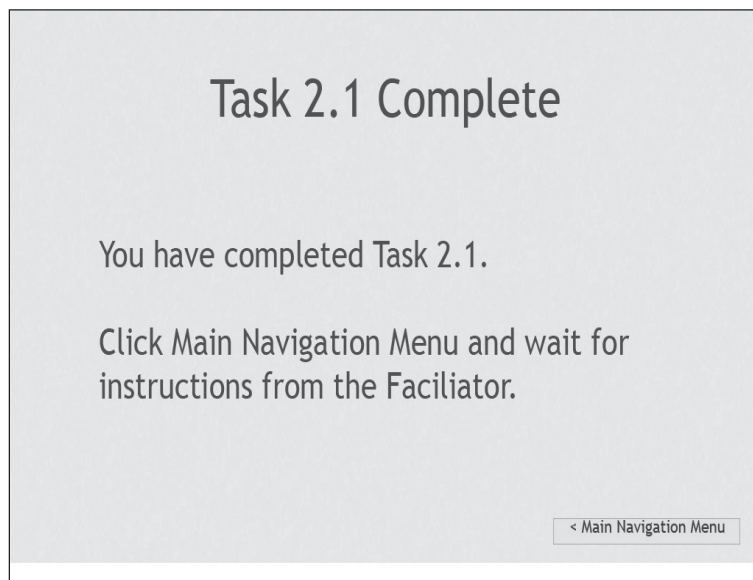
Slide15

Task 2.1 Complete

You have completed Task 2.1.

Click Main Navigation Menu and wait for instructions from the Faciliator.

< Main Navigation Menu



Slide16

Task 2.2



Please wait for instructions from the Facilitator.

< Back Next >

Slide17

[2.2.password]
Your password is “password”. Enter your password below when finished reading the tablet page.

Password:

Review Area

Question 11 of 21

Slide18



Slide19



[2.2.43]

What are your options as described by this page?

255-character limit

Review Area

Submit

[2.2.qq]

As it is displayed on this page, what do you understand the phrase “In-App Purchase” to mean?

255-character limit

Review Area

Question 14 of 21

Submit

References

Slide22

[2.2.q5]

As it is displayed on this page, what do you understand the phrase “Do not require a password for future purchases” to mean?

255-character limit

Content In App Purchase

When you purchase an app or game, you can choose whether or not to require a password for future purchases. If you choose “Do not require a password,” you won’t need to enter a password each time you purchase an app or game from the App Store.

Do not require a password for future purchases

Require a password for future purchases

When you purchase an app or game, you can choose whether or not to require a password for future purchases. If you choose “Do not require a password,” you won’t need to enter a password each time you purchase an app or game from the App Store.

Do not require a password for future purchases

Require a password for future purchases

Question 15 of 21

Submit

Slide23

[2.2.q6]

As it is displayed on this page, what do you understand the phrase “Require a password for future purchases (turns on Parental Controls)” to mean?

255-character limit

Content In App Purchase

When you purchase an app or game, you can choose whether or not to require a password for future purchases. If you choose “Require a password,” you’ll need to enter a password each time you purchase an app or game from the App Store.

Do not require a password for future purchases

Require a password for future purchases

When you purchase an app or game, you can choose whether or not to require a password for future purchases. If you choose “Require a password,” you’ll need to enter a password each time you purchase an app or game from the App Store.

Do not require a password for future purchases

Require a password for future purchases

Question 16 of 21

Submit

Slide24

[2.2-q7]

As it is displayed on this page, what is your understanding of “Parental Controls”?

255-character limit

Continue to App Purchase

Parental controls restrict purchases on the App Store and the iTunes Store. You can choose to require a password for purchases, or you can choose to allow purchases without a password. You can also choose to restrict the types of content that can be purchased. For more information, see the Apple Support page on Parental Controls.

Continue to App Purchase

Question 17 of 21

Submit

Slide25

[2.2-q8]

What do you think will happen if you select “Do not require a password for future purchases,” enter your password, and select “Continue”?

255-character limit

Continue to App Purchase

Parental controls restrict purchases on the App Store and the iTunes Store. You can choose to require a password for purchases, or you can choose to allow purchases without a password. You can also choose to restrict the types of content that can be purchased. For more information, see the Apple Support page on Parental Controls.

Continue to App Purchase

Question 18 of 21

Submit

Slide28

[2.2.q11]

What, if anything, do you think you can do if you want to prevent being charged money for actions taken while your child/grandchild uses the app?

255-character limit

Review Area

Submit

Slide29

Task 2.2 Complete

You have completed Task 2.2.

Click Main Navigation Menu and wait for instructions from the Faciliator.

[< Main Navigation Menu](#)

1 **Task 3**

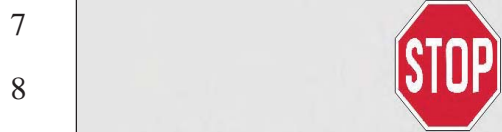
2

3 Slide1

4

5 Task 3

6



9 Please wait for instructions from the
10 Facilitator.

11

12 [Next >](#)

13

14

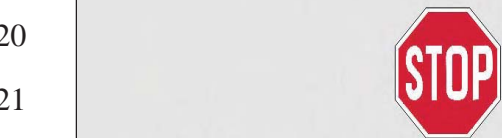
15

16 Slide2

17

18 Task 3.1

19



22 Please wait for instructions from the
23 Facilitator.

24

25 [Next >](#)

26

27

Slide3

[3.1.q1]
What information is provided by this email?

255-character limit

Renewal area

Question 1 of 11

Submit

Slide4

[3.1.q2]
As described in this email, what is the name of the product that has been ordered?

255-character limit

Review Area

Question 2 of 11

Submit

Slide5

[3.1.q3]
As described in this email, when was this product ordered?

255-character limit

Review Area

Question 3 of 11

Submit

Slide6

[3.1.4.q]

If you received this email, do you think your credit card on file with Amazon has been charged for buying this product?

☒ Yes
☐ No
☐ Unsure

Review Area

Question 4 of 11

Submit

Slide7

[3.1.4.q1]

How much money do you think your credit card on file with Amazon has been charged for this order?

255-character limit

Review Area

Question 5 of 11

Submit

Slide8

[3.1.4.q2]
Why don't you think your credit card on file with Amazon has been charged for buying this product, or why were you unsure?

255-character limit


Review Area

Question 6 of 11

Submit

Slide9

Task 3.2



You have completed Task 3.1.

Please wait for instructions from the Facilitator.

Next >

Slide10

[3.2.q1]
What possible way or ways could you try to contact Amazon and request a refund from Amazon?

255-character limit

Review Area

Question 7 of 11

Submit

Slide11

[3.2.q2]
Are there other possible ways to contact Amazon to request a refund? Please identify.

255-character limit

Review Area

Question 8 of 11

Submit

Slide12

Task 3.3



You have completed Task 3.2.

Please wait for instructions from the Facilitator.

Next >

Slide13

[3.3.contact]
Enter the word “finished” when instructed
by the Facilitator.

Submit

Review Area

Question 9 of 11

Slide14



Slide15

[3.3.q1]

What method or methods did you use to try to contact Amazon?

255-character limit

Review Area

Question 10 of 11

Submit

Slide16

[3.3.q2]
How difficult was it to contact Amazon before the facilitator told you to stop?

Very Difficult	Difficult	Neutral	Easy	Very Easy
1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Review Area

Question 11 of 11

Submit

Slide17

Task 3 Complete



You have completed Task 3.3.

Please wait for instructions from the Facilitator.

Appendix H: Curriculum Vitae

Craig S. Rosenberg, Ph.D.

An accomplished human factors engineer, user interface designer, and systems and software engineer specializing in analysis and design of mobile computing devices, complex systems, user centered design, information architecture, user experience, systems and software engineering, object oriented analysis, and modeling and simulation. Extensive experience in the entire software design and development life cycle applied to a wide range of domains from embedded mobile devices through enterprise class mission critical applications.

SUMMARY OF QUALIFICATIONS

- Human Factors, User Interface Design, Information Architecture, Cognitive Engineering, Experimental Design
- Systems Engineering, Software Architecture, Modeling and Simulation, Virtual Environments, Animation, Art
- C++, C, C#, JAVA, UML, .NET, VISUAL BASIC, HTML, XML, LISP, FORTRAN, SAS
- Visual Studio, Eclipse, Rhapsody, RSA/RSM, ClearCase, ClearQuest, Dreamweaver, Photoshop, Illustrator
- 3D Studio, Alias, AutoCAD, Rogue Wave, GD Pro, Motif, Builder Accessory, JSPWiki, Spark, MS Office
- Windows, Linux, OSX, PC, Macintosh, Sun, HP, IBM, StereoGraphics

- Scholarship from the Interservice/Industry Training Simulation & Education Conference
- Moderator of the Seattle Android Users Group and founder of the Northwest Alias Users Group

EDUCATION

- Ph.D. Human Factors, University of Washington, 1994
- M.S. Human Factors, University of Washington, 1990
- B.S. Industrial Engineering, University of Washington, 1988
- Graduate GPA: **3.83**

PROFESSIONAL EXPERIENCE

Global Technica, Seattle, WA

Nov 1996 - Present

Senior human factors engineer, user interface designer, and software architect for a wide range of advanced commercial and military programs.

- Senior modeling and simulation engineer developing advanced discrete event and agent based software tools, models, and simulations in the areas of missile defense, homeland security, battle command management, networking and communications, mobile computing, air traffic control, software simulation, and UAV command and control.
- Lead system architect developing advanced air traffic control analysis applications, toolsets, and trade study simulations for Boeing Air Traffic Management. Technical lead responsible for tasking of twelve engineers.

- Architect of the Boeing Human Agent Model; an advanced model for the simulation of human sensory, cognitive, and motor performance as applied to the roles of air traffic controllers, pilots, and UAV operators.
- Lead human factors engineer and user interface designer for Boeing's main internal vector and raster computer aided drafting and editing system that produces all maintenance manuals, shop floor illustrations, and service bulletins for all Boeing commercial aircraft.
- Systems Engineer for the Future Combat Systems Network Systems and Software Engineering group.
- Senior Software Developer for Level 11 and Disney, working on software for tracking of visitors to Disney World

Additional responsibilities include system engineering, requirements analysis, functional specification, use case development, user stories, application prototyping, modeling and simulation, object oriented software architecture, graphical user interface analysis and design, as well as UML, C++, C#, and Java software development.

WhereWuz, Seattle, WA

March 2010 - Present

Founder, inventor, user interface designer, and software architect for a company producing advanced mobile software running on GPS enabled smartphones. WhereWuz allows users to record exactly where they have been and query this data in unique ways for subsequent retrieval based on time or location. Currently available for iPhones and Android handheld devices.

1 **Entrepreneur in Residence,**
2 **Spyglass Ventures, Los Angeles, CA**

April 2008 – Dec 2009

3 Lead technologist and entrepreneur in residence for a Los Angeles based media oriented
4 venture capital firm focusing on early stage private equity investing. Responsibilities
5 include evaluating investment opportunities, generating new business ideas, and
6 providing functional expertise to assist existing investments in the mobile and
7 entertainment sectors.
8

9 **User Interface Designer,**
10 **ObjectSpeed, Seattle WA**

Feb 2006 – June 2007

11 Lead user interface and interaction designer for a technology company specializing in
12 consumer hand held VoIP products. Responsible for all user interface design, user
13 interaction, information architecture design, industrial design and human factors
14 activities. Additional responsibilities include functional specification, human factors
15 analysis, requirements analysis, application prototyping, graphical design, and user
16 interface programming for a hand held VoIP mobile consumer device.
17
18

19 **User Interface Designer,**
20 **Ahaza Systems, Seattle, WA**

June 2001 - Dec 2001

21 Lead user interface and interaction designer responsible for all user interface design and
22 development activities associated with a complete line of advanced IPv6 network
23 hardware devices. Duties include user interface design, human factors analysis, and
24 interactive application prototyping.
25
26
27

**User Interface Designer,
Eyematic Interfaces, Seattle, WA**

Oct 99 - April 2001

Lead human factors and interaction designer responsible for all user interface design and development activities associated with real-time mobile hand held 3D facial tracking, animation, avatar creation and editing software. Duties include requirements analysis, functional specification, user interface design, and human factors analysis.

**User Interface Designer,
AT&T Wireless/ Teague Corporation, Redmond, WA**

June 95 - March 96

Lead human factors and interaction designer for a large industrial design firm. Responsible for all functionality, human factors analysis, user interface design, graphical design, systems analysis, and documentation for the first two-way wireless pager produced by AT&T Wireless.

**Associate Assistant Professor
University of Washington, Seattle, WA**

Dec 94 - Dec 95

Human Factors Professor at the University of Washington Industrial Engineering Department. Duties include teaching, writing research proposals, designing and conducting funded human factors experiments for the National Science Foundation, as well as hiring and supervising students.

**Software Design Engineer
Socha Computing, Bellevue, WA**

Aug 94 - Sept 95

Responsible for designing and developing interactive multimedia games as well as educational software for children and adults. Duties include functional specification,

1 software design and architecture, user interface design, application prototyping, software
2 development, focus group testing, and internet research.

3
4 **Network Engineer,**
5 **PSF Industries, Seattle, WA**

March 92 - Nov 96

6 Independent consultant to a mechanical engineering firm specializing in the design,
7 fabrication, and installation of large scale, high pressure vessels. Responsible for
8 designing, procuring, and installing a state of the art networked computer aided
9 engineering system to greatly improve design quality and engineer productivity.

10
11 **Human Factors Researcher**
12 **University of Washington, Seattle, WA**

Jan 89 - June 94

13 Responsible for designing and performing advanced human factors experiments relating
14 to virtual worlds and advanced visualization research. Funded by the National Science
15 Foundation to conduct research on advanced software and hardware interfaces for virtual
16 environments. Duties include user interface design, systems design, software
17 development, graphics programming, experimental design, as well as hardware and
18 software interfacing.

19
20
21 **Alias Animator,**
22 **Technology Design, Bellevue, WA**

April 91 - Jan 92

23 Independent contractor to an industrial design firm specializing in high technology
24 hardware design for computers and consumer electronics products. Created models,
25 animations, and renderings that were used for product engineering and marketing.
26 Services also included training, hardware and software installation, and system
27 optimization.

1 **Operations Manager,**
2 **Micro Products, Bellevue, WA**

June 88 - Sept 88

3 Managed large scale computer graphics conversion contracts. Installed and optimized a
4 custom optical scanning and capture system for a computer graphics scanning company.
5 Responsibilities also included employee management, production scheduling,
6 subcontracting and outsourcing, and software development.
7

8 **Industrial Engineering Consultant,**
9 **Avtech Corporation, Seattle, WA**

Jan 88 - June 88

10 Professional industrial engineer for a large aerospace digital electronics company. Solely
11 responsible for completely redesigning the entire manufacturing facility to optimize the
12 assembly of multiple lines of digital avionics communication equipment. Additional
13 responsibilities included integrating software for a CNC milling center to completely
14 automate the production of lighted instrument displays panels.
15

16
17 **ADDITIONAL INFORMATION**

18 I have published twenty-two research papers in professional journals and proceedings
19 relating to user interface design, computer graphics, and the design of spatial,
20 stereographic, and auditory displays. I was the sole recipient of a \$10,000 scholarship
21 award from the I/ITSEC for advancing the field of interactive computer graphics for
22 flight simulation. I received an award from the Link Foundation for my work furthering
23 the field of virtual interface design. I created five book covers for books by Harcourt
24 Brace Publishing that feature the authors Arthur C. Clarke, Isaac Asimov, and Stephen
25 King. Several minutes of my computer graphics animations appear in the movie Beyond
26
27

1 the Mind's Eye produced by MIRAMAR. I have won two engineering design awards
2 from the City of Los Angeles for the design of an energy saving product. In my free time
3 I enjoy creating computer graphic images and animations as well as composing and
4 recording music. My company's website can be found at: www.globaltechnica.com
5
6
7
8

9 **SELECTED PUBLICATIONS**

- 10
11 Rosenberg C., Advanced Systems Engineering and Human Factors Engineering,
12 International Forum on Composite Material Applications for Large Commercial
13 Aircraft, Shanghai, China, 2011.
- 14 Parks P., Rosenberg C., Interactive Distributed Simulation Environment for Collaborative
15 Technology Experiments and Analysis, SimTecT, Brisbane, Australia, 2008.
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18 Seattle, WA, 2006.
- 19 Barfield, W., Rosenberg, C., & Lotens, W. A., Augmented-Reality Displays. In W.
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Appendix I: Materials Considered

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Exhibit H

Exhibit H

Rosenberg - Confidential
FTC v. Amazon.com, Inc.

1/7/2016

1 UNITED STATES DISTRICT COURT
2 FOR THE WESTERN DISTRICT OF WASHINGTON
3
4
5 FEDERAL TRADE COMMISSION,)
6 Plaintiff,)
7 vs.) Case No.
8 AMAZON.COM, INC.,) 2:14-cv-01038-JCC
9 Defendant.)
10 _____)
11
12

13 VIDEOTAPED DEPOSITION OF CRAIG S. ROSENBERG
14

15 January 7, 2016
16 Seattle, Washington
17

18 ***** Confidential *****
19
20

21 The deposition of CRAIG STUART ROSENBERG was taken
22 on Thursday, January 7, 2016, commencing at 9:05 a.m., at the
23 Federal Trade Commission, 915 Second Avenue, Suite 2896,
24 Seattle, Washington, before John M.S. Botelho, CCR, RPR,
25 Certified Court Reporter.

For The Record, Inc.
(301) 870-8025 - www.ftrinc.net - (800) 921-5555

Rosenberg - Confidential
FTC v. Amazon.com, Inc.

1/7/2016

1 APPEARANCES

2

3 ON BEHALF OF THE PLAINTIFF:

4 Helen Wong

5 Katherine Worthman

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9 Washington, D.C. 20580

10 202.326.3779

11 202.326.3768 Fax

12 hwong@ftc.gov

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14

15 ON BEHALF OF THE DEFENDANT:

16 Jeffrey M. Hanson

17 Perkins Coie

18 1201 Third Avenue

19 Suite 4900

20 Seattle, Washington 98101

21 206.359.8000

22 206.359.4206 Fax

23 jhanson@perkinscoie.com

24

25 Also present: Melody Sorensen, videographer

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FTC v. Amazon.com, Inc.

1/7/2016

1 PROCEEDINGS

2

3 THE VIDEOGRAPHER: We're now on the
4 record. Please note that recording will continue
5 until all parties agree to go off the record. My
6 name is Melody Sorensen, videographer for For the
7 Record, Inc. Today is January 7th, 2016, and the
8 time is now 9:05 a.m.

9 This is the videotaped deposition of Craig
10 Rosenberg being taken in the case of Federal Trade
11 Commission vs. Amazon.com, Inc., Cause No.
12 2:14-cv-01038-JCC. This deposition is being held at
13 915 Second Avenue, Room 2896, Seattle, Washington.

14 Will the attorneys please introduce themselves
15 for the record, including the parties they represent.

16 MS. WONG: I'm Helen Wong. I'm
17 appearing on behalf of the plaintiff, Federal Trade
18 Commission.

19 MS. WORTHMAN: Katherine Worthman,
20 on behalf of the Federal Trade Commission.

21 MR. HANSON: Jeff Hanson, on behalf
22 of Amazon.

23 THE VIDEOGRAPHER: The court
24 reporter today is John Botelho. Please swear in the
25 witness and proceed.

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Rosenberg - Confidential

FTC v. Amazon.com, Inc.

1/7/2016

1 CRAIG S. ROSENBERG, having been first duly sworn
2 by the Certified Court
3 Reporter, deposed and
4 testified as follows:
5

6 EXAMINATION

7 BY MS. WONG:

8 Q Mr. Rosenberg, can you please state and spell your
9 full name for the record?

10 A Sure. Craig Rosenberg. Craig Stuart Rosenberg.
11 C-r-a-i-g S-t-u-a-r-t R-o-s-e-n-b-e-r-g.

12 Q Have you ever been deposed before?

13 A I have.

14 Q How many times?

15 A Five times.

16 Q Okay. So I'll just -- I'll remind you of some ground
17 rules so that we're on the same page. I'll be asking
18 you a series of questions, and everything we say will
19 be recorded. Where possible, please try to give a
20 verbal response so that it appears on the transcript.
21 If I ask a question and you did not understand,
22 please let me know and I'll repeat it. If you answer
23 a question, I will assume that you understand it.

24 If at any point you need a break, please let me
25 or your attorney know, and answer the question that's

1 together made it such that I couldn't test everything
2 we spoke earlier in the deposition about, given an
3 arbitrarily long time, could have tested every
4 interface.

5 Q So despite not testing the interface from 2011 until
6 May 2013, you still believe that the conclusions of
7 your study can be generalized to Amazon app users in
8 2011 and 2012?

9 A Well, I think some of the questions apply. Like I
10 just said, some of the questions definitely apply.
11 But some of them don't. I'd have to go and review
12 the specific questions. But if it says, you know,
13 "What's your understanding of parental controls?" --
14 in the earlier interface, I mean, you could ask that
15 in general: "What's your understanding of parental
16 controls?" But I think it was more tied to the task
17 at hand and the later two interfaces where that term
18 actually appears on the dialogue box.

19 Q Okay. Going back to the script. I think we're still
20 on Page 72. So we were at the section where
21 Ms. Miller, on Paragraph 33 of Page 71, tells the
22 users to press "Key Details" on the screen. The
23 pop-up window should appear. She asks if everyone
24 can see it. And then she states, "Please use your
25 finger to scroll down. And you will see the section

Rosenberg - Confidential

FTC v. Amazon.com, Inc.

1/7/2016

1 CERTIFICATE OF REPORTER

2

3 DOCKET/FILE NUMBER: 2:14-cv-01038-JCC

4 CASE TITLE: FTC v. AMAZON.COM, INC.

5 HEARING DATE: JANUARY 7, 2016

6

7 I HEREBY CERTIFY that the transcript contained
8 herein is a full and accurate transcript of the steno
9 notes transcribed by me on the above cause before the
10 FEDERAL TRADE COMMISSION to the best of my knowledge
11 and belief.

12

13 DATED: January 11, 2016

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16 _____
JOHN M.S. BOTELHO

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Exhibit I

Exhibit I

UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF WASHINGTON

FEDERAL TRADE COMMISSION,

Plaintiff,

v.

AMAZON.COM, INC.,

Defendant.

Case No. 2:14-cv-01038

**EXPERT REPORT OF
BARRY A. SABOL, PH.D.**

Background and Qualifications

1. My curriculum vitae appears as Exhibit A to this report.

2. Strategic Consumer Research, Inc., of which I am founder and President, was engaged by Perkins Coie, on behalf of its client, Amazon.com, Inc., to design and execute a scientific study to measure experiences and perceptions with respect to contacting Amazon customer service, experiencing Amazon customer service as well as likely actions and perceptions in the instance of receiving an email from Amazon showing a charge for an unrecognized digital purchase. This study was conducted among Amazon digital product purchasers in general including a subset of In-App Purchasers.

3. For the past 33 years, I have designed, executed and interpreted over one thousand research studies similar to the one detailed in this report. During this time, Strategic Consumer Research, Inc. and I have conducted similar scientific studies for hundreds of companies, which have relied on the results of said studies to make business decisions and develop strategies relating to their products and services.

4. I have provided sworn testimony in a number of lawsuits over the past seven years. A list of the cases in which I have provided sworn testimony during that period is attached as Exhibit B.

5. I was first contacted by Amazon.com attorneys and retained in early November 2015 to conduct the survey and provide this expert report. Strategic Consumer Research, Inc. was paid a total of \$71,000 to design and execute this research study. This compensation was not contingent upon the obtained study results, nor was it contingent on the opinions I render for the interpretation of the study results, or the outcome of this case.

Summary of Conclusions

6. This study was conducted primarily to measure experiences and perceptions with respect to contacting Amazon customer service among Amazon digital product purchasers in general and Amazon In-App Purchasers in particular, as well as likely actions and perceptions in the instance of receiving an email from Amazon showing a charge for an unrecognized digital purchase.

7. To make this determination, I conducted an anonymous survey of 1,237 Amazon customers including 301 In-App Purchasers who (a) had children under the age of 17 living in their households (and thus likely had younger children in the households during the 2011—2014 period) and (b) who had purchased a digital product from Amazon. This survey was conducted online using a widely-accepted and commonly used methodology. Respondents were asked about the following:

- Whether or not they had ever contacted Amazon's customer service for any reason about a digital product. A digital product was defined as a video, a song, an app or an in-app purchase.
- Among those who had actually contacted Amazon's customer service about a digital product, the ease or difficulty of doing so, relative to their experiences with other companies.
- Among those who had actually contacted Amazon's customer service about a digital product, their evaluation of the customer service experience relative to their experiences with other companies.

- Among those who had never contacted Amazon's customer service about a digital product:
 - The perceived ease or difficulty of doing so in relation to other companies.
 - The perceived evaluation of the likely customer service experience relative to their experience with other companies.
- The likelihood of contacting Amazon's customer service if they received an email from Amazon showing that they had been charged by Amazon for a digital product purchase that they did not recognize.
- The extent to which digital product purchasers think that they would be entitled to a refund:
 - If they received an email from Amazon showing that they were charged by Amazon for a digital product purchase that they did not recognize.
 - If Amazon's stated policy was that digital products were not returnable, but they received an email from Amazon showing that they were charged by Amazon for a digital product purchase that they did not recognize.

When those who had contacted Amazon's customer service about a digital product were asked if it was easier, about the same or more difficult to do so compared to their experiences with other companies, 94% responded that it was easier (73%) or about the same (21%). There was no significant difference between In-App Purchasers (97%) and Non-In-App Purchasers (92%). This data suggests that the vast majority of In-App and Non-In-App digital product purchasers had no more difficulty in contacting Amazon's customer service than they had ever experienced with any other company and in fact strong majorities of both digital product

purchaser groups indicated that it was easier to contact Amazon's customer service than had been their experience with other companies (In-App – 74%, Non-In-App – 72%).

When those who had contacted Amazon's customer service about a digital product were asked if their experience with Amazon's customer service was better, about the same or worse than their experiences with other companies, 96% responded that it was better (77%) or about the same (19%). There was no significant difference between In-App Purchasers (99%) and Non-In-App Purchasers (95%).

When those who had never contacted Amazon's customer service about a digital product were asked if they thought that it would be easier, about the same or more difficult to contact Amazon's customer service compared to other companies, 94% responded that it would be easier (46%) or about the same (48%). There was no significant difference between In-App Purchasers (97%) and Non-In-App Purchasers (93%).

When those who had never contacted Amazon's customer service about a digital product were asked if they thought that the experience with Amazon's customer service would be better, about the same, or worse than their experiences with other companies, 97% responded that it would be better (58%) or about the same (39%). There was no significant difference between In-App Purchasers (98%) and Non-In-App Purchasers (97%).

When asked how likely they would be to contact Amazon's customer service if they received an email from Amazon showing that they were charged by Amazon for a digital product purchase that they did not recognize, 95% responded that they would be very likely (84%) or somewhat likely (11%) to do so. There was no significant difference between In-App Purchasers (95%) and Non-In-App Purchasers (95%).

When asked if they thought that they would be entitled to a refund if they received an email from Amazon showing that they were charged by Amazon for a digital product purchase that they did not recognize, 92% responded in the affirmative with no significant difference between In-App Purchasers (93%) and Non-In-App digital product purchasers (92%).

When asked if they thought that they would be entitled to a refund if Amazon's stated policy was that digital products were not returnable, but they received an email from Amazon showing that they were charged by Amazon for a digital product purchase that they did not recognize, 91% responded in the affirmative with no difference between In-App (91%) and Non-In-App (91%) digital product purchasers.

I understand from having read the expert report submitted by Jennifer King that it is her belief that contacting Amazon's customer service to request a refund for a digital product purchase is complex and time consuming and that Amazon did not effectively convey to consumers that refunds were available for accidental or unauthorized in-app purchases or how to request such refunds. My survey results show otherwise. The vast majority of Amazon digital product purchasers and In-App Purchasers in particular:

- Found it to be or believe it to be easier to contact Amazon's customer service than they have experienced with other companies.
- Found or believed that the actual Amazon customer service experience was or would be better than what they had experienced at other companies.
- Would be likely to contact Amazon's customer service if they received an email from Amazon showing that they were charged by Amazon for a digital product purchase that they did not recognize.

- Believe that they would be entitled to a refund if they received an email from Amazon showing that they were charged by Amazon for a digital product purchase that they did not recognize.
- Believe that they would be entitled to a refund if Amazon's stated policy was that digital products were not returnable, but they received an email from Amazon showing that they were charged by Amazon for a digital product purchase that they did not recognize.

Introduction

8. The overriding goals of this study were:
 - To determine actual and perceived level of difficulty in contacting Amazon's customer service
 - To determine actual and perceived quality of Amazon's customer service
 - To determine the likelihood of contacting Amazon's customer service about any unrecognized digital product purchase
 - To determine beliefs about refunds for unrecognized digital products purchases
9. The survey instrument appears in Exhibit C.
10. The methodology and survey questionnaire are described below.
11. Other materials considered for this report are the FTC's Complaint for Permanent Injunction and Other Equitable Relief, filed July 20, 2014, and the expert reports of Jennifer King and Daniel S. Hamermesh, Ph.D, dated October 16, 2015, and October 15, 2015, respectively.

Survey Methodology

Survey Participants

12. This research study was designed to elicit beliefs surrounding contacting Amazon's customer service about digital product purchases and the availability of refunds for unrecognized digital product purchases. This was done by having respondents answer a number of specific questions designed to elicit these responses.

Studies using this type of design and methodology are widely used to produce empirical data regarding consumer attitudes, beliefs and behavior.

Studies of this type are widely used and relied upon by companies to gauge consumer attitudes, beliefs and behaviors.

This study design is widely used by our company and many others, and consistently produces valid, reliable data useful for decision-making.

This type of quantitative study produces valid, reliable empirical data which can be used to test/validate/refute claims made by the parties in this case.

13. The relevant survey universe for this study consisted of consumers who (1) had children under age 17 currently living in their households; and (2) had purchased a digital product from Amazon. A digital product was described as a video, song, app or in-app purchase.

14. This study was conducted using a web-based survey to collect data. Pivotal to conducting a web-based survey is the acquisition of e-mail addresses of the relevant universe, so that invitations to participate in a survey can be sent. In this case, no database existed which met the criteria for the relevant survey universe, necessitating that the relevant survey universe be

constructed through screening of general consumer population databases. This study relied on such a database panel provided by Research Now.

15. This panel identifies consumers with respect to the presence of children under age 17 in the household, but not Amazon digital product purchasers. This was accomplished through screening questions contained in the survey instrument. All respondents were promised confidentiality of responses and in fact the survey was conducted on a blind basis with respect to the names of the participants. Participant names were not and are not known. There was no pre- or post-survey contact with any of the participants. The survey itself was never identified as being undertaken for any particular purpose, including this lawsuit.

16. This survey began on November 19, 2015, and concluded on November 28, 2015. The median time to complete the survey was 1.4 minutes per respondent. All respondents were provided an incentive to participate by Research Now using their own established guidelines for respondent incentives for their constructed panels. This practice is common to all panels constructed for research purposes by all companies who construct them. Panels of this type offer potential respondents monetary or other incentives to participate prior to their actual entry into the survey website. Thus, incentives are not contingent upon any particular response or result.

17. A total of 2,614 potential respondents entered the survey website. After answering all screening questions (to become members of the relevant survey universe), there were 1,237 qualified respondents. The disposition of terminated respondents was as follows:

No children under age 17 in household	183
No digital purchases from Amazon	1,135
Abandoned the survey prior to completing the entire questionnaire	59
Qualified and completed survey	1,237

18. The final sample size of 1,237 qualified respondents yields a maximum error rate (margin of error) of $\pm 2.7\%$ at the 95% confidence interval. This means that if this same survey were to be conducted 100 times with different populations of 1,237 qualified consumers, the obtained results would not differ by more than 2.7% in 95 of 100 cases. This is a very low margin of error and makes this an exceptionally reliable study.

There was a subsample of 301 In-App Purchasers as part of the total sample described above. This sample of 301 respondents yields a maximum error rate of $\pm 5.8\%$ and the Non-In-App sample of 936 respondents yields a maximum error rate of $\pm 3.3\%$, both at the 95% confidence interval.

The Survey Questionnaire

19. All potential respondents who accepted the invitation to participate in this survey by clicking the link in the invitation e-mail were introduced to the survey as follows: “Thank you for participating in this survey which will take no more than 2 minutes to complete. Your responses will be kept completely confidential. There are no right or wrong answers. Your opinion is all that counts.”

20. All potential respondents were then asked: “Do you have any children under the age of 17 living in your household?” All those responding in the negative were terminated,

while those responding in the positive were next asked: “Have you ever purchased any one or more of the following digital products from Amazon:

- ☐ A video
- ☐ A song
- ☐ An app
- ☐ An in-app purchase
- ☐ None of these

All those responding “none of these” were terminated, while those choosing one or more digital products were next asked:

“Have you ever contacted Amazon’s customer service for any reason about a digital product? A digital product is defined as a video, a song, an app or an in-app purchase?”

- ☐ Yes
- ☐ No

21. Those respondents who answered “no” were skipped past the next two questions.

Those respondents who answered “yes” were next asked:

“Compared to your experience with other companies, was it easier, about the same or more difficult to contact Amazon’s customer service?”

- ☐ Much easier
- ☐ A little easier
- ☐ About the same
- ☐ A little more difficult
- ☐ Much more difficult

– And –

“Compared to your experience with other companies, was your experience with Amazon’s customer service better, about the same or worse than with other companies?”

- Much better
- A little better
- About the same
- A little worse
- Much worse

22. Those respondents who answered “yes” to the earlier Amazon customer service contact question were skipped past the next two questions. Those respondents who answered “no” to the earlier Amazon customer service contact question were next asked:

“Compared to other companies, do you think it would be easier, about the same or more difficult to contact Amazon’s customer service?”

- Much easier
- A little easier
- About the same
- A little more difficult
- Much more difficult

– And –

“Compared to your experience with other companies, do you think your experience with Amazon’s customer service would be better, about the same or worse than with other companies?”

- Much better
- A little better
- About the same
- A little worse
- Much worse

23. **ALL** respondents were next asked:

“If you received an email from Amazon showing that you were charged by Amazon for a digital product purchase that you did not recognize, how likely would you be to contact Amazon’s customer service?”

- Very likely
- Somewhat likely
- Unsure
- Somewhat unlikely
- Very unlikely

Those who chose either the very likely or somewhat likely responses were skipped past the next question. Those who chose the unsure, somewhat unlikely or very unlikely responses were next asked:

“Why would you be unsure or unlikely to contact Amazon’s customer service?”

24. **ALL** respondents were next asked the final two questions:

“If you received an email from Amazon showing that you were charged by Amazon for a digital product purchase that you did not recognize, do you think you would be entitled to a refund for that charge?”

- Yes
- No
- Not sure
- And –

“If Amazon’s stated policy was that digital products were not returnable, but you received an email from Amazon showing that you were charged by Amazon for a digital product purchase that you did not recognize, do you think you would be entitled to a refund for that charge?”

- Yes
- No
- Not sure

25. The survey concluded with the following statement: “Thank you very much for your time.”

Survey Results

26. This survey analysis was based on the responses of 1,237 consumers who had children under age 17 living in the household and who had made a digital product purchase from Amazon. This data has been analyzed in total and by In-App Purchasers and Non-In-App Purchasers with the following maximum margins of error:

Total (N=1,237)	±2.7%
In-App Purchasers (N=301)	±5.8%
Non-In-App Digital Product Purchasers (N=936)	±3.3%

This data was analyzed using StatPac statistical analysis software. This statistical analysis software is used by many market research companies and has been used continuously by me and my company for over 25 years. Over that period, I have gained experience in the use of the program and the interpretation of results. A cross-tabulation program was used to compare responses between In-App Purchasers and Non-In-App digital product purchasers in order to detect statistically significant differences in responses. Throughout the balance of this report, arrows (→ ←) are used to denote statistically significant differences between responses of respondents comprising these two customer segments. The level of statistical significance testing used throughout this analysis was $p < .01$. This means that where statistical significance was found, there is only 1 chance in 100 that this obtained result could have occurred by chance.

27. For each analysis detailed in this section of this report, the results will be detailed along with an explanation of the significance of the finding and in some cases a conclusion for each significant finding.

28. The first analysis details the types of digital product purchases made by this sample of respondents. As can be seen in the table below, there was no difference between In-App and Non-In-App Purchasers in terms of the rates of purchasing videos or songs.

Digital Product	Total (N=1,237)	In-App Purchasers (N=301)	Non-In-App Purchasers (N=936)
A video	59%	58%	60%
A song	55%	60%	53%
An app	47%	67%	→ 41%
An in-app purchase	24%	100%	→ 0%

29. The next analysis compared rates of actually contacting Amazon customer service for any reason about a digital product. While 22% had done so overall, In-App Purchasers were more likely to have contacted Amazon customer service than Non-In-App Purchasers as shown in the table below:

Ever Contacted Amazon Customer Service About Digital Product?	Total (N=1,237)	In-App Purchasers (N=301)	Non-In-App Purchasers (N=936)
Yes	22%	35%	18%
No	78%	65%	82%

30. The next analysis focused only upon those respondents who had contacted Amazon's customer service about a digital product. These respondents were asked:

"Compared to your experience with other companies, was it easier, about the same or more difficult to contact Amazon's customer service?"

Overall, 94% responded that it was easier (73%) or about the same (21%) to contact Amazon's customer service compared to other companies. Among In-App Purchasers, 97% responded that it was easier (74%) or about the same (23%) relative to other companies. This data, presented in the table below, also shows that there were no significant differences between In-App Purchasers and Non-In-App Purchasers in their responses.

Ease or Difficulty in Contacting Amazon Customer Service?	Total (N=272)	In-App Purchasers (N=105)	Non-In-App Purchasers (N=167)
Much easier	42%	45%	41%
A little easier	31%	29%	31%
About the same	21%	23%	20%
A little more difficult	6%	3%	8%
Much more difficult	0%	0%	0%

31. The next analysis again focused only upon those respondents who had contacted Amazon’s customer service about a digital product. These respondents were asked:

“Compared to your experience with other companies, was your experience with Amazon’s customer service better, about the same or worse than with other companies?”

Overall, 97% responded that their experience was better (77%) or about the same (20%) as their experiences with the customer service departments of other companies. Among In-App Purchasers, 99% responded that their experience with Amazon’s customer service was better (76%) or about the same (23%) compared to other companies. This data, presented in the table below, also shows that there were no significant differences between In-App Purchasers and the purchasers of other digital products in their responses.

Amazon Customer Service Experience	Total (N=272)	In-App Purchasers (N=105)	Non-In-App Purchasers (N=167)
Much better	47%	49%	45%
A little better	30%	27%	32%
About the same	20%	23%	17%
A little worse	3%	1%	5%
Much worse	<1%	0%	1%

32. While the previous two analyses focused upon actual contact experiences with Amazon’s customer service, this next analysis focuses upon the expected ease or difficulty of contacting Amazon’s customer service among those respondents who had not done so. This information is relevant to determine whether there is any reputational deterrent to contacting Amazon’s customer service. These respondents were asked:

“Compared to other companies, do you think it would be easier, about the same or more difficult to contact Amazon’s customer service?”

Overall, 94% responded that they thought it would be easier (46%) or about the same (48%) to contact Amazon’s customer service compared to other companies. Among In-App Purchasers, 97% responded that they thought it would be easier (55%) or about the same (42%) to contact Amazon’s customer service relative to other companies. This data, presented in the table below, also shows that there were no significant differences between In-App Purchasers and purchasers of other digital products in their responses.

Expected Ease or Difficulty to Contact Amazon Customer Service?	Total (N=965)	In-App Purchasers (N=196)	Non-In-App Purchasers (N=769)
Much easier	21%	25%	20%
A little easier	25%	30%	24%
About the same	48%	42%	49%
A little more difficult	5%	2%	6%
Much more difficult	1%	1%	1%

33. The next analysis focuses upon the expected experience with Amazon’s customer service compared to other companies, again among those who had not contacted Amazon’s customer service about a digital product. These respondents were asked:

“Compared to your experience with other companies, do you think your experience with Amazon’s customer service would be better, about the same or worse than with other companies?”

Overall, 97% responded that they thought the Amazon customer service experience would be better (58%) or about the same (39%) relative to their experiences with other companies. Among In-App Purchasers, 99% responded that they thought the Amazon customer service experience would be better (60%) or about the same (39%) as they had experienced at other companies. This data, presented in the table below, also shows that there were no significant differences between In-App and Non-In-App Purchasers.

Expected Amazon Customer Service Experience	Total (N=965)	In-App Purchasers (N=196)	Non-In-App Purchasers (N=769)
Much better	22%	23%	22%
A little better	36%	37%	36%
About the same	39%	39%	39%
A little worse	2%	1%	2%
Much worse	1%	<1%	1%

Actual vs. Expected Ease or Difficulty of Contacting Amazon’s Customer Service

34. As can be seen in the table below, the actual experience of contacting Amazon’s customer service was found to be better than the expected experience of contacting Amazon’s customer service. This data suggests that Amazon exceeds customer expectations regarding the ease or difficulty of contacting Amazon’s customer service.

Ease or Difficulty to Contact Amazon’s Customer Service?	Total		In-App Purchasers		Non-In-App Purchasers	
	Actual (N=272)	Expected (N=965)	Actual (N=105)	Expected (N=196)	Actual (N=167)	Expected (N=769)
Much easier	42%	→ 21%	45%	→ 25%	41%	→ 20%
A little easier	31%	25%	29%	30%	31%	24%
About the same	21%	← 48%	23%	← 42%	20%	← 49%
A little more difficult	6%	5%	3%	2%	8%	6%
Much more difficult	0%	1%	0%	1%	0%	1%

Actual vs. Expected Amazon Customer Service Experience

35. As can be seen in the table below, the actual Amazon customer service experience was found to be better than the expected Amazon customer service experience. This data suggests that Amazon’s customer service experience exceeds customer expectations.

Amazon Customer Service Experience	Total		In-App Purchasers		Non-In-App Purchasers	
	Actual (N=272)	Expected (N=965)	Actual (N=105)	Expected (N=196)	Actual (N=167)	Expected (N=769)
Much better	47%	→ 22%	49%	→ 23%	45%	→ 22%
A little better	30%	36%	27%	37%	32%	36%
About the same	20%	← 39%	23%	← 39%	17%	← 39%
A little worse	3%	2%	1%	1%	5%	2%
Much worse	<1%	1%	0%	<1%	1%	1%

36. The next analysis focused upon the likelihood of respondents contacting Amazon if they received an email from Amazon showing a charge they did not recognize. All respondents were asked:

“If you received an email from Amazon showing that you were charged by Amazon for a digital product purchase that you did not recognize, how likely would you be to contact Amazon’s customer service?”

Overall, 95% responded that they would be very likely (84%) or somewhat likely (11%) to contact Amazon’s customer service. This was true for both In-App Purchasers and Non-In-App Purchasers as shown in the table below.

Likelihood to Contact Amazon?	Total (N=1,237)	In-App Purchasers (N=301)	Non-In-App Purchasers (N=936)
Very likely	84%	84%	84%
Somewhat likely	11%	11%	11%
Unsure	4%	4%	4%
Somewhat unlikely	1%	1%	1%
Very unlikely	<1%	<1%	<1%

37. The next analysis focuses upon the reasons given by those who indicated in the previous question that they would be somewhat unlikely, very unlikely or unsure if they would contact Amazon if they received an email from Amazon showing a charge for a digital product which they did not recognize. These respondents were asked:

“Why would you be unsure or unlikely to contact Amazon’s customer service?”

Verbatim responses are summarized below:

Contact Amazon Customer Service?

Unsure (N=44)	Somewhat Unlikely (N=10)	Very Unlikely (N=5)
Don't know / Not sure / NA (19) No need to (9) Depends on amount (7) Not sure how (1) Poor service (1) I speak broken English (1) Like to solve things on my own (1) No help (1) They wouldn't help me (1) Don't usually do that (1) Don't have time (1) If I ran into some trouble (1)	Long process (1) Wouldn't feel the need (1) Don't like to deal with people – prefer troubleshooting (1) No reason to contact them (1) Difficult to find a number to call (1) No problems with them (1) Not much help (1) Probably nothing wrong (1) Usually satisfied with Amazon and don't have a need to call customer service (1) No time (1)	The wait (1) They rarely mess up (1) I'd call my bank (1) You can never get a human being at Amazon (1) In past dealings I had to be transferred several times just to get right department and still got nowhere with the problem (1)

Only 9 of 59 comments reflect poorly on Amazon. This represents less than 1% of the total sample of respondents.

38. The next analysis focuses upon customer refund expectations for digital products. All respondents were asked:

“If you received an email from Amazon showing that you were charged by Amazon for a digital product purchase that you did not recognize, do you think you would be entitled to a refund for that charge?”

Overall, 92% responded that they thought they would be entitled to a refund. Only 3% responded with “no” while 5% were “not sure.” Among In-App Purchasers, 93% indicated that they thought they would be entitled to a refund. As can be seen in the table below, there were no significant differences between In-App and Non-In-App Purchasers.

Entitled to Refund?	Total (N=1,237)	In-App Purchasers (N=301)	Non-In-App Purchasers (N=936)
Yes	92%	93%	92%
No	3%	4%	3%
Not sure	5%	3%	5%

39. The next analysis focuses upon customer refund expectations for digital products in light of Amazon’s return policy. All respondents were asked:

“If Amazon’s stated policy was that digital products were not returnable, but you received an email from Amazon showing that you were charged by Amazon for a digital product purchase that you did not recognize, do you think you would be entitled to a refund for that charge?”

Overall, 91% responded in the affirmative. This was also true for In-App and Non-In-App Purchasers. Only 2% of all three respondent groups responded in the negative, while 7% of

each group responded that they were not sure. As can be seen in the table below, there were no significant differences between In-App and Non-In-App Purchasers.

Entitled to Refund?	Total (N=1,237)	In-App Purchasers (N=301)	Non-In-App Purchasers (N=936)
Yes	91%	91%	91%
No	2%	2%	2%
Not sure	7%	7%	7%

Final Observations and Conclusions

40. My report outlines behaviors and attitudes of Amazon digital product purchasers and In-App Purchasers in particular with respect to contacting Amazon customer service and the Amazon customer service experience from both an actual and expected viewpoint.

The King report concludes that contacting Amazon's customer service to request a refund for a digital product purchase is complex and time consuming. The results of my study stand in stark contrast to this assertion. The vast majority of Amazon digital product purchasers, including In-App Purchasers, found it easier or no more difficult to contact Amazon's customer service than they had experienced with other companies. The vast majority of Amazon digital product purchasers, including In-App Purchasers, reported that the Amazon customer service experience was better than or the same as other companies they had dealt with.

This study also found that Amazon's actual delivery of customer service contact and experience exceeded customer expectations.

The King report, which is based on her subjective, theoretical analysis, also concludes that Amazon did not effectively convey to consumers that refunds were available for accidental

or unauthorized in-app purchases or how to request such refunds. The results of the study which I conducted among 1,237 actual Amazon digital product purchasers challenges this assertion, including the implicit contention that customers would not have understood that refunds were available unless Amazon so explicitly stated in the emailed order confirmation:

- 95% of all Amazon digital product purchasers and 95% of In-App Purchasers would contact Amazon if an unrecognized charge appeared in an email from Amazon. Less than 2% of all Amazon digital product purchasers (including In-App Purchasers) were unlikely to do so. And only 15% of those few purchasers who were unsure or unlikely to contact Amazon said so for a reason reflecting poorly on Amazon.
- 92% of all Amazon digital product purchasers and 93% of In-App Purchasers expected unrecognized charges in emails from Amazon to be refunded. Only 3% of all digital product purchasers and 4% of In-App Purchasers did not think they would be entitled to a refund.
- 91% of all Amazon digital product purchasers and 91% of In-App Purchasers expected unrecognized charges in emails from Amazon to be refundable even in light of Amazon's stated policy that digital products are not returnable. Only 2% of all digital product purchasers and 2% of In-App Purchasers did not think they would be entitled to a refund even in light of the stated policy.

Thus, the vast majority of Amazon digital product purchasers and In-App Purchasers in particular would seek refunds for unrecognized charges detailed in emails from Amazon and believe and have found that it would be easy to contact Amazon's customer service and that the

Amazon customer service experience would and has been found to be better than or equal to other companies.

Date: December 7, 2015

Barry A. Sabol, Ph.D.
President of Strategic Consumer Research, Inc.

Amazon customer service experience would and has been found to be better than or equal to other companies.

Date: December 7, 2015



Barry A. Sabol, Ph.D.
President of Strategic Consumer Research, Inc.

EXHIBIT A

Curriculum Vitae of Dr. Barry A. Sabol

Barry Allan Sabol, Ph.D.
President
Strategic Consumer Research, Inc.
26250 Euclid Avenue
Cleveland, Ohio 44132
216-261-0308
bsabol@scr-research.com

Professional Experience

President – Strategic Consumer Research, Inc.

1982 – Present

- Founded firm in 1982
- Responsible for all phases of project design, analysis and reporting
- Responsible for client development and support
- Expertise in many types of research including:
 - Advertising Effectiveness
 - Awareness and Image Assessment
 - Competitive Positioning
 - Customer Satisfaction and Loyalty Measurement
 - Market and Store Performance Assessment Tracking
 - Market/Customer Segmentation
 - New Concept Testing
 - New Product/Service Evaluation
 - Website Navigation Evaluation

Research Director – Fox and Associates, Inc.

1978 – 1982

- Responsible for the design, development and execution of quantitative consumer attitude, opinion, image, awareness and demographic research studies for clients of this full-service advertising agency.

Research Specialist – Psychological Research Services

1975 – 1978

- Responsible for the development and execution of projects within the areas of training needs assessment, training, training program evaluation, performance appraisal, organizational analysis, testing, test validation and survey research.

Professional Organizations/Activities

1995 – 2006	Member of the Thiel College Board of Trustees Greenville, Pennsylvania Vice Chairman 2001-2002
1979 – Present	Member of the American Marketing Association Cleveland Chapter President in 1989-1990
1983 – 1990	Board Officer for the Cuyahoga County Drug Abuse Services Chairman in 1990
1991 – 2000	Board Officer for The Cleveland Treatment Center, a Cleveland area heroin-addiction treatment center

Publications

Sirdeshmukh, Deepak, Singh, Jagdip and Sabol, Barry (2002), "Consumer Trust, Value and Loyalty in Relational Service Exchanges, *Journal of Marketing*, 66 (January): 15-37.

The preceding was also published by the Marketing Science Institute as working paper and Report No: 01-116 for distribution worldwide to managers, researchers and companies affiliated with the MSI.

Wilcott, R.C., Sabol, B.A. and Yurchesen, R.P., Frontal Cortex and Response Suppression in the Rat. Brain, Behavior and Evolution, 1976, 13, 116-124.

Wilcott, R.C. & Sabol, B.A., Response Suppression Produced by Electrical Stimulation in the Neocortex of the Cat, Neuropsychologia, May 1976.

Teaching Experience

Guest Lecturer – MBA Marketing Research	2006 - 2010
Weatherhead School of Management Case Western Reserve University, Cleveland, Ohio	

Academic History

Ph.D. Quantitative Design and Research Analysis	1979
Case Western Reserve University, Cleveland, Ohio	
Masters Psychology	1976
Case Western Reserve University, Cleveland, Ohio	
Bachelors Psychology	1974
Thiel College, Greenville, Pennsylvania	

EXHIBIT B

Past Four-Year Sworn Testimony by Dr. Barry A. Sabol

Dr. Barry A. Sabol has testified as an expert witness in one case in the past four years:

Promark Brands Inc. and H.J. Heinz Company, Opposers,
V. GFA Brands, Inc., Applicant
Opposition No. 91194974
– By deposition, March 12, 2013

EXHIBIT C

Survey Instrument

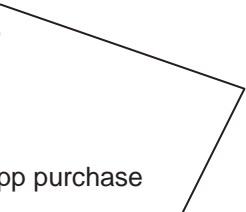
DIGITAL PRODUCT PURCHASER
FINAL SURVEY INSTRUMENT

Thank you for participating in our survey. There are no right or wrong answers. Your honest opinions are all that count. This survey should take no more than 5 minutes to complete. First . . .

SCREEN A: Do you have any children under the age of 17 currently living in your household?

- 1 Yes (**CONTINUE**)
- 2 No (**THANK AND TERMINATE**)

SCREEN B: Have you ever purchased any one or more of the following **DIGITAL PRODUCTS** from **AMAZON**: (**CIRCLE ALL PURCHASED**)

- 1 A video
 - 2 A song
 - 3 An app
 - 4 An in-app purchase
 - 5 None of these (**THANK AND TERMINATE**)
- CONTINUE**
- 

1. Have you ever contacted Amazon's customer service for any reason about a digital product?
A digital product is defined as a video, a song, an app or an in-app purchase.

- 1 Yes (**ASK Q. 1A AND Q. 1B, THEN SKIP TO Q. 3**)
- 2 No (**SKIP TO Q. 2**)

1A. Compared to your experience with other companies, was it easier, about the same or more difficult to contact Amazon's customer service?

- 1 Much easier
- 2 A little easier
- 3 About the same
- 4 A little more difficult
- 5 Much more difficult

1B. Compared to your experience with other companies, was your experience with Amazon's customer service better, about the same or worse than with other companies?

- 1 Much better
- 2 A little better
- 3 About the same
- 4 A little worse
- 5 Much worse

2. Compared to other companies, do you think it would be easier, about the same or more difficult to contact Amazon's customer service?

- 1 Much easier
- 2 A little easier
- 3 About the same
- 4 A little more difficult
- 5 Much more difficult

2A. Compared to your experience with other companies, do you think your experience with Amazon's customer service would be better, about the same or worse than with other companies?

- 1 Much better
- 2 A little better
- 3 About the same
- 4 A little worse
- 5 Much worse

3. If you received an email from Amazon showing that you were charged by Amazon for a digital product purchase that you did not recognize, how likely would you be to contact Amazon's customer service?

- 1 Very likely
 - 2 Somewhat likely
 - 3 Unsure
 - 4 Somewhat unlikely
 - 5 Very unlikely
- (SKIP TO Q. 4)
- (CONTINUE)

3A. Why would you be unsure or unlikely to contact Amazon's customer service?

4. If you received an email from Amazon showing that you were charged by Amazon for a digital product purchase that you did not recognize, do you think you would be entitled to a refund for that charge?

-1 Yes

-2 No

-3 Not sure

5. If Amazon's stated policy was that digital products were not returnable, but you received an email from Amazon showing that you were charged by Amazon for a digital product purchase that you did not recognize, do you think you would be entitled to a refund for that charge?

-1 Yes

-2 No

-3 Not sure

Exhibit J

Exhibit J

UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF WASHINGTON
AT SEATTLE

FEDERAL TRADE COMMISSION,

Plaintiff,

v.

AMAZON.COM, INC.

Defendant.

Case No. 2:14-CV-01038-JCC

EXPERT REPORT OF ANDREW L. SEARS, PH.D.

December 7, 2015

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I. Qualifications

1. I am the Dean of and a Professor in the College of Information Sciences and Technology at The Pennsylvania State University. I have been working in the field of computer science with a focus on human-computer interaction since 1988. I earned a Bachelor's Degree in Computer Science from Rensselaer Polytechnic Institute in 1988 and a Ph.D. in Computer Science from the University of Maryland, College Park, in 1993. The chair of my doctoral dissertation committee at the University of Maryland was Professor Ben Shneiderman. Jennifer King relies upon Professor Shneiderman in her expert report and identified him as one of the "[l]eading researchers" in the field of human-computer interaction. I concur that he is one of the leading researchers in the field of human-computer interaction. Indeed, Professor Shneiderman is responsible for many innovative ideas, methods, and tools widely accepted today, such as direct-manipulation interface design, advances in information visualization, and his well-respected "Eight Golden Rules of Interface Design" first explained in his leading treatise "Designing the User Interface: Strategies for Effective Human-Computer Interaction" published in 1986. Professor Shneiderman also is well known for contributing to the development of the research area of universal usability, a concept pertinent to my expert opinions set forth below.
2. My research has explored many aspects of human-computer interaction, including the use of mobile devices, touchscreen-based interfaces, web-based interactions, and accessibility in the context of computing technologies. My research has been funded by various government agencies, foundations, and corporations, including the National Science Foundation, the National Institute on Disability and Rehabilitation Research, the National Institute of Standards and Technology, the Verizon Foundation, IBM, and Motorola.
3. In addition to my academic research and teaching, I have advised a variety of companies and organizations in the areas of human-computer interaction and user-interface design, including design for mobile devices and touchscreen-based interactions.
4. I served as a founding Editor-in-Chief of the Association for Computing Machinery's (ACM's) journal "Transactions on Accessible Computing" before becoming a member of that journal's editorial board. I also served on the editorial boards of several additional journals,

including ACM's "Transactions on Computer-Human Interaction," the "European Journal of Information Systems," the "International Journal of Human-Computer Studies," and "Universal Access in the Information Society."

5. I served as Conference and Technical Program Co-Chair of the premier conference on human-computer interaction: ACM Conference on Human Factors in Computing Systems (CHI 2001) and as both General Chair and Program Chair for the premier conference on accessibility in the context of computing: ACM SIGACCESS Conference on Computers and Accessibility (ASSETS 2004 and ASSETS 2005). I served as the Chair of the ACM Special Interest Group on Accessible Computing and as a member of the ACM Council. I currently serve as a member of the Board of Directors for the Computing Research Association. I was named an ACM Distinguished Scientist in 2010.

6. I have received numerous awards in recognition of my service to both the ACM Special Interest Group for Computer Human Interaction (1998, 1999, 2001) and the ACM Special Interest Group for Accessible Computing (2004, 2005). As a doctoral student, I was selected to receive a fellowship by NASA, which supported my PhD studies, and I was also selected to participate in the Doctoral Consortium at CHI 1992.

7. I was first contacted by Amazon.com attorneys on October 23, 2015, and retained to review and, if appropriate in my opinion, respond to Ms. King's expert report. I am being compensated for my work on behalf of Amazon at the rate of \$1000 per hour. My compensation is not contingent upon the outcome of my opinions or of this litigation.

II. Introduction

A. Assignment

8. I was retained in late October 2015 by counsel for Amazon to serve as an expert witness for purposes of consultation and potential expert testimony in the case of *FTC v. Amazon.com, Inc.* Specifically, I was asked to analyze the expert report of Jennifer King and to opine on the following:

- a. Whether the methods and practices described and used by Ms. King in her expert report in this case are consistent with accepted and reliable methods and practices in

academic and commercial fields related to human-computer interaction and user-interface design.

- b. Whether Amazon's Kindle Fire tablet interfaces, notifications, and descriptions associated with in-app purchases were so far below contemporary, accepted business practices that they would have unfairly confused parents about the presence of and opportunity to make in-app purchases, about the presence of and opportunity to enable Parental Controls to restrict in-app purchases, or the availability of and means to request a refund for any accidental or unwanted in-app purchases.
- c. The veracity of Ms. King's opinions, including her conclusions "that Amazon did not effectively convey to consumers downloading an in-app charge app (an app containing in-app charges) from the Amazon Appstore that children could incur in-app charges"; "that Amazon did not effectively convey to consumers downloading an in-app charge app from the Amazon Appstore that they would have to change their device settings to prevent children from incurring in-app charges without parental involvement"; "that Amazon did not effectively convey to consumers who incurred unauthorized in-app charges that refunds were available for those charges from Amazon"; and "that Amazon did not effectively convey to consumers who incurred unauthorized in-app charges how to request a refund for those charges from Amazon."

B. Information Considered

9. My opinions are based on more than twenty-five years of knowledge, skill, experience, training, and education in the field of human-computer interaction and user-interface design. The list of specific materials I considered and relied upon in forming my opinions in this report is available at Appendix B.

C. Summary of Opinions

10. Usability is a subjective concept that evolves with time and experience and must be viewed with great care and consideration and in context. Context includes users, user goals, prior

experience, state-of-the-art, environment, system capabilities, and system goals. As a result, what is considered well designed at one point in time may be considered poorly designed at another point in time. Current understanding of usability may appear obvious in hindsight, but it is often the result of significant research or extensive trial and error unavailable at launch.

11. There is significant risk by imposing liability for negative results during usability trial and error or while exploring new options in an effort to improve upon the status quo. Unless liability is limited to situations in which the design was objectively unreasonable at launch or made in bad faith—and not simply sub-optimal, particularly in hindsight—the risk of liability will deter positive efforts and hamper innovation.

12. Understanding usability requires knowledge of the intended users and the various tasks those users may want to complete. Tasks are often prioritized; compromises in design are often necessary and recommended. Time and experience routinely redefine usability. Changed understanding of user ability and technological capability often create new opportunities for improved human-computer interaction and user-interface design.

13. It is common and accepted practice for organizations to release a product, observe how the product is used, gather feedback from users, and revise the product to address user concerns and improve the user experience. Amazon's in-app-purchase innovations for usability are consistent with this accepted approach.

14. Heuristic usability evaluations or “inspections” such as Ms. King undertook here have significant limitations, particularly where they are performed by evaluators with limited formal training or usability experience. Even when performed by experts, results from heuristic evaluations typically differ from one individual to the next; thus, it is strongly discouraged to rely on a single, subjective evaluation to categorically establish usability or “effectiveness.”

15. There is no single accepted set of heuristics, and isolated heuristic evaluations are prone to overemphasizing the severity of perceived problems, including identifying false-positives—items that would not actually create problems for users interacting with a live system. Reliable heuristic evaluations require the use of multiple evaluators to independently review a system and systematically aggregate the results while carefully assessing the existence and severity of potential problems.

16. The methods and practices described and used by Ms. King in her expert report are inconsistent with accepted and reliable methods and practices in academic and commercial fields related to human-computer interaction and user-interface design. Ms. King's goal of identifying major flaws is particularly susceptible to the shortcomings of heuristic evaluation, and her opinions were not informed by more reliable user testing or surveys.
17. Ms. King often draws sweeping, unqualified conclusions about wide swaths of tablet users and interfaces without statistical support. Ms. King erroneously assumes that Amazon's primary task is always to address in-app purchasing and Parental Controls; she fails to recognize the variety of tasks at issue, the various users, the context of the marketplace and the device; and she applies a standard of perfection or best practice, with the aid of hindsight, that is uncalled for in the field and inappropriate where, as here, the question is whether Amazon's practices were unfair, not whether they were imperfect.
18. Ms. King identifies a collection of potential or candidate problems of uncertain reliability and unknown severity, and her solutions, where suggested, do not adequately consider context, show little or no appreciation for competing design objectives, and could introduce unaddressed and unintended consequences.
19. Contrary to Ms. King's opinion, I conclude that Amazon's initial design and refinement process were reasonable and consistent with the practice of the industry. In several ways it was superior to the state-of-the-art, as it provided more detailed information about in-app purchasing, immediate notification of purchases, and Parental Controls to give customers more options with respect to their children's activities. Amazon designed for parents to exercise control over their account-connected devices, and Amazon's launch-and-learn approach and constant refinement is a preferred approach in the industry to improving usability.
20. Amazon's Kindle Fire tablet interfaces, notifications, and descriptions associated with in-app purchases did not fall so far below contemporary, accepted business practices that they would have unfairly confused parents about the presence of and opportunity to make in-app purchases, about the presence of and opportunity to enable Parental Controls to restrict in-app purchases, or the availability of and means to request a refund for any accidental or unwanted in-app purchases.

III. Analysis

A. Usability Must Be Viewed In Context

21. Usability is largely a subjective concept that evolves with time and experience. There is no single definition of usability. What is usable for one group of individuals may be poorly designed for another group of individuals. What is well designed for one set of tasks may be poorly designed for another set of tasks. What is considered well designed at one point in time may be considered poorly designed at another point in time.

22. It is therefore critical that context be considered when evaluating usability. Context includes not only the users of the system and the goals of those users but also the users' prior experience, both with the system and with other systems that may have existed at the time, and the overall environment in which the system will be used.¹

23. Understanding usability requires knowledge of the intended users and the various tasks those users may want to complete. The more diverse the population of potential users, the more challenging it can be to design solutions that effectively address the goals and abilities of all users. Designing for diverse tasks also introduces challenges. Tasks are often prioritized, based on the current understanding of which tasks users consider most important or which tasks they will complete most often. It has been long accepted that compromises are necessary for well-designed applications, and designs often must necessarily focus on key segments of the target population and frequent or important tasks.² As a result, some features that are important for a specific segment of the population may be less obvious or accessible than other features, which were considered more relevant or important for a larger subset of the population.

24. Since the concept of usability evolves with time and experience, a system may be well designed when introduced only to be critiqued or redesigned later because the community's understanding of usability or design has changed. While the new standard for what constitutes "well designed" may appear obvious in hindsight and with evolving goals, it is often the result of significant research or extensive trial and error, which was not available when the system was

¹ See, for example, Hartson, R., & P.S. Pyla, The UX Book: Process and guidelines for ensuring a quality user experience, Elsevier (2012).

² Ibid.

first introduced. Many interfaces have been designed with the best of intentions and in such a way that was consistent with or superior to what had been state-of-the-art at the time, only to have aspects of the user interaction redesigned after the product was released because it was determined that a redesigned solution would provide a superior user experience.³

1. Time and Experience Redefines What Is Usable

25. Time and experience routinely redefine usability and what both users and designers consider well designed. The evolution of touchscreen-based interfaces and keyboards serves as an example of how time and experience affects what is considered usable. In the mid- and late 1980s, it was widely believed that touchscreens could only be used to select relatively large objects. At the same time, the state-of-the-art was to design interfaces such that selections were made based on where the user's finger initially contacted the screen.⁴ That was the norm, and systems were designed leveraging this understanding.

26. While the original strategy, known as "land on," allowed for selection of large objects, researchers developed new interaction techniques, including what became known as the "lift-off" strategy. The lift-off strategy allows users to reposition their finger before lifting it from the screen.⁵ The location where the finger is lifted from the screen is activated rather than the location where the finger first touches the screen. Even with the lift-off strategy, however, the size of the objects an individual could select remained limited. In the late 1980s, researchers demonstrated that carefully designed touchscreen-based interactions could allow users to select smaller targets than previously believed.⁶

27. This changed understanding of how user ability (for finger location) and technological capability (for smaller-area selections) combine created new opportunities for improved human-computer interaction and user-interface design. And although those practices are now accepted

³ Ibid.

⁴ Potter, Richard L., Linda J. Weldon, and Ben Shneiderman. "Improving the accuracy of touch screens: an experimental evaluation of three strategies." Proceedings of the SIGCHI conference on Human factors in computing systems. ACM, 1988.

⁵ Ibid.

⁶ Sears, Andrew, and Ben Shneiderman. "High precision touchscreens: design strategies and comparisons with a mouse." International Journal of Man-Machine Studies 34.4 (1991): 593-613.

standards in the touchscreen market, no reasonable human-computer-interaction expert would conclude that the early touchscreen designs were ineffective or were so far below any accepted standard to be considered unusable or unfair at the time they were introduced.

28. The evolution of touchscreen-based keyboards may be even more dramatic.⁷ Land-on selection has been replaced by lift-off selection. Larger keys have been replaced by smaller keys. Even small lift-off-based touchscreen keyboards have evolved significantly. For example, gesture-based interactions have been integrated, allowing users to drag their finger from one letter to the next, entering a complete word in a single action, and predictive technologies allow users to enter complete words without having to enter each individual letter.⁸ Dictionary-based techniques, combined with knowledge of common errors, allow touchscreen keyboards to automatically correct some errors.

29. Some improvements are driven by changes in the underlying technologies, while others are a result of trial and error, a desire to improve upon the status quo, and exploring new options. There is significant risk by imposing liability for negative results during such trial and error or while exploring new options in an effort to improve upon the status quo. Unless liability is limited to situations in which the design was objectively unreasonable at launch or made in bad faith—and not simply sub-optimal, particularly in hindsight—that risk of liability will deter such positive efforts and hamper innovation.

30. A touchscreen keyboard that only allowed individual letters to be entered with each touch—using the land-on or lift-off strategy—would have been state-of-the-art in the late 1980s. In many contexts, this same keyboard would likely be considered poorly designed by today’s standards, particularly given users’ exposure to and current understanding of auto-correct algorithms, predictive algorithms, and gesture-based interactions in the context of text entry. The time at which an interface was developed must be considered when analyzing whether it was a reasonable solution when it was introduced.

⁷ Sears, Andrew, et al. “Investigating touchscreen typing: the effect of keyboard size on typing speed.” *Behaviour & Information Technology* 12.1 (1993): 17-22.

⁸ See, for example, Zhai, Shumin, and Per Ola Kristensson. “The word-gesture keyboard: reimagining keyboard interaction.” *Communications of the ACM* 55.9 (2012): 91-101.

31. As a result, analyzing the usability of a system that existed at some point in the past, with the goal of understanding how well a system was designed, requires great care and consideration of the context in which the system was produced. Importantly, this requires consideration of what was known and what was considered state-of-the-art at the time. A system may have been well designed when introduced, based on what was known at the time, only to be less than ideal at the present. Without that understanding and careful evaluation, there otherwise remains significant risk that reliance on hindsight will produce merely differences of opinion on optimization, not objective assessment of usability or reasonableness.⁹

2. State of the Art for In-App Purchases in November 2011

32. The evolution of how users were informed about in-app purchases is another example. When Amazon introduced in-app purchases in November 2011, both Apple and Google had already been providing apps that offered in-app purchases. The user experience provided by Apple and Google, who were the largest providers of apps that include in-app purchases, was state-of-the-art at the time. To be sure, Apple and Google are skilled, respected consumer companies with particularly strong reputations for user-interface design and ease of use. Apple began offering apps with in-app purchasing in October 2009.¹⁰ Yet according to the FTC's complaint against Apple, even by November 2011 Apple was not providing any up-front disclosure regarding the existence of in-app purchases.¹¹ Nor was Apple providing any immediate notification to the device owner after an in-app purchase was completed. Similarly,

⁹ Ms. King often ignores the importance of context and time. For example, she identifies one study finding that confusion between apps being advertised as free but, in fact, not free to use has led to consumer disappointment and lower consumer ratings. Expert Report of Jennifer King at 20. Yet the results of that study were reported in May of 2015, nearly four years after Amazon launched in-app purchases. Amazon could not have designed its products in 2011 based on the insights provided by an article published four years later.

¹⁰ Expert Report of Ravi Dhar, October, 16, 2015.

¹¹ *In re Apple Inc.*, Dkt. No. C-4444, Complaint, Federal Trade Commission (Mar. 2014) (FTC_AMZ_00000001). Contrary to the representation in the FTC's complaint against Apple, it may be that by November 2011 Apple included on its app-description page a limited note about in-app purchases. (I understand from Amazon's counsel that the FTC refused to provide information to Amazon in this case about Apple's or Google's in-app purchase disclosures and interfaces.) Even if so, Amazon still met and exceeded the state-of-the-art because it too included a description, its description was detailed, and it specifically identified Parental Controls.

even by November 2011, Google was not providing any up-front disclosure regarding the existence of in-app purchases.¹²

33. When Amazon launched in-app-purchasing opportunities in November 2011, Amazon went beyond then-accepted state-of-the-art. Amazon included a description of the availability of in-app purchases on an app's description page. That note began with large, all capitalized letters stating "PLEASE NOTE." It described in-app purchasing, including that such purchases were paid for using "actual money." And it explained that users could configure Parental Controls.¹³ That these details had been excluded by the other market participants supports the conclusion that Amazon was operating above contemporary, accepted business practices with regard to making this information available to all users including parents.

34. Moreover, unlike Apple, in November 2011 (and through today), Amazon *immediately* emailed an order-confirmation receipt to the account holder after each in-app-purchase. That email receipt included detailed information about each purchase, including the name and cost of the product and the order number. It also included links to the user's account page as well as to Amazon help pages.¹⁴ That Amazon included those details and links in an immediate confirmatory email further supports the conclusion that Amazon's in-app purchasing practices exceeded those of its largest competitors and then-standard practices.

3. Design, Release, and Redesign Is An Accepted Practice

35. Usability is not a formula-driven concept. It is based on the experiences of the users. As a result, it is common for organizations to release a product, observe how the product is used, gather feedback from users, and revise the product to address user concerns and improve the user experience. It is common for this to be an interactive process involving multiple releases as the system is improved.¹⁵ This is consistent with the approach Amazon employed here. Design,

¹² *In re Google Inc.*, Dkt. No. C-4499, Complaint, Federal Trade Commission (Dec. 2014) (FTC_AMZ_00000025).

¹³ Expert Report of Jennifer King (October 16, 2015) at 25, Fig. 4; Expert Report of Ravi Dhar (October 16, 2015) ¶¶ 54-55.

¹⁴ Expert Report of Jennifer King (October 16, 2015) at 43, Fig. 12; Expert Report of Ravi Dhar (October 16, 2015) ¶ 36 & Appendix A.

¹⁵ Hartson, R., & P.S. Pyla, *The UX Book: Process and guidelines for ensuring a quality user experience*, Elsevier (2012).

release, and redesign is not only supported by the usability community and literature but also has distinct advantages in terms of obtaining the most pertinent feedback, ensuring earlier entry of competitive alternatives, and furthering innovative approaches.

36. As already noted, Amazon’s initial release of in-app purchasing in 2011 went beyond what was state-of-the-art by providing both an up-front notification about in-app purchases and immediate email updates whenever in-app purchases were made. This was followed by multiple revisions to how in-app purchases were introduced and how in-app purchases were completed. Passwords were introduced for certain in-app purchases in 2012 in response to insights gained based on customer behaviors. The Key Details feature was introduced in 2013, providing users with an additional way to learn about in-app purchases. Which purchases required a password continued to evolve based on user experiences, with a new requirement in May 2013 that a password be entered prior to the first in-app purchase regardless of the cost. This same dialog box informed users that they could require a password for all future in-app purchases by turning on Parental Controls. Building on knowledge gained from user experiences, the current interface was introduced in June 2014. This interface requires users to explicitly choose between requiring and not requiring a password for future purchases.

37. An iterative approach involving product launch, user review and feedback, and refinement—such as that used by Amazon—is a preferred approach that allows for continuous improvement of the user experience. Usability and innovation in design will suffer if companies avoid addressing known interface issues or refrain from exploring ways to improve user design because they fear that making such improvements will invite litigation based on the (incorrect) assumption by others that the changes indicate their original designs were unreasonable.

B. Heuristic Evaluations Are Less Reliable and Prone to Error if Applied Incorrectly

38. Even at a fixed point in time, usability is a subjective concept. What is ideal for one individual may be less than ideal for another. What is usable for one individual may be less than clear to another individual. There is no “formula” based approach that can be applied to ensure that a system is usable. As a result, various methodologies have been developed to evaluate

usability in the context of information technologies. When used properly, these methodologies can help identify and address usability problems.

39. Many methodologies are available for evaluating usability. The website Usability.gov, as Ms. King mentions in her report, is one useful resource that summarizes a number of methodologies. However, Usability.gov does not provide a comprehensive understanding of the issues involved and should not be relied on in isolation.

40. Some usability evaluation methodologies are based on direct input from users, often based on interactions with some version of the system in question. These are important techniques because, as highlighted by usability expert Dana Chisnell, on whom Ms. King also relies, there is no substitute for observing users interacting with a system if the goal is to understand the user experience.¹⁶ Other methodologies rely on input from usability experts, who provide insights based on their own personal review of or interaction with some version of the system. Due to the subjective nature of usability, an effective evaluation—whether user- or expert-based—relies on input from multiple individuals rather than on the input of just a single individual.

41. Ms. King's identified method for evaluating the "effectiveness" of Amazon's in-app-purchasing process is not a usability test but a "usability inspection." But a usability inspection is a collection of techniques, not a single methodology.¹⁷ Later, Ms. King clarifies that she conducted a "heuristic evaluation." Stated differently, she "review[ed] an application interface for compliance with an accepted set of heuristics."¹⁸

42. The history of heuristic evaluation within the human computer interaction community is typically traced back to the early 1990s and research reported by Jakob Nielsen. As detailed below, however, extensive subsequent research now reveals that there are important limitations with a heuristic evaluation. Heuristic evaluations are inherently subjective, and they are even less reliable when the evaluator has limited formal training or experience in usability concepts.

¹⁶ Chisnell, Dana. "What you really get from a heuristic evaluation." UX Magazine, Feb. 19, 2010. <http://uxmag.com/articles/what-you-really-get-from-a-heuristic-evaluation>

¹⁷ See, for example, Mack, R. L., & Nielsen, J. (Eds.). (1994). Usability inspection methods. New York, NY: Wiley & Sons.

¹⁸ Expert Report of Jennifer King (October 16, 2015) at 13 & n.3.

Indeed, even experienced heuristic evaluators typically produce different results when evaluating the same subject. There is no single “accepted set of heuristics.” Isolated heuristic evaluations are also prone to overemphasize the severity of perceived problems and identify false-positives—items that would not actually create problems for users interacting with a live system. The more reliable, accepted method for heuristic evaluation requires the use of multiple usability experts to independently review the system, followed by careful analysis involving multiple individuals that assesses the severity of the potential problems. This severity analysis reduces false-positives and better assesses the severity of potential problems. Ms. King’s much more informal process does not account for the synthesis of information that would reduce the presence of false-positives and better assess the severity of potentially problems, and therefore her conclusions are subject to those flaws.

1. Heuristic Evaluations Are Subjective

43. Critically, studies confirm that usability is a subjective concept and different individuals applying this same technique will often arrive at different conclusions. Expertise (or lack thereof) affects those conclusions, and heuristic evaluation is more effective when the individuals performing the evaluation have formal training or usability experience. Importantly, even when the individuals are usability experts, results typically differ from one individual to the next. Because variation in usability opinions is inevitable, it is strongly discouraged to rely on a single, subjective evaluation to categorically establish usability or “effectiveness.”¹⁹

2. Reliable Application of Heuristic Evaluation Requires the Use of Multiple Evaluators

44. Also critical to an effective heuristic evaluation is the use of multiple evaluators to independently assess and then evaluate others’ assessments. The need for multiple evaluators has been a well-documented guiding principle for at least 20 years.²⁰ Even Usability.gov, on which Ms. King relies, emphasizes this requirement.²¹ Jakob Nielsen, also on whom Ms. King relies

¹⁹ <http://www.nngroup.com/articles/how-to-conduct-a-heuristic-evaluation>; Nielsen, Jakob. “Finding usability problems through heuristic evaluation.” Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI ’92), ACM, New York, NY, USA, 373-380.

²⁰ Ibid.

²¹ <http://www.usability.gov/how-to-and-tools/methods/heuristic-evaluation.html>.

and who is often credited as one of the scholars who introduced this approach to the community, similarly cautions about the importance of using multiple evaluators.²² To use techniques like heuristic evaluation properly, several usability experts should independently review the system. This initial review should be followed by a systematic approach to aggregate evaluations, synthesize the inputs gathered, and assess the existence and severity of potential problems.

3. Heuristic Evaluations Can Overestimate the Severity of Potential Problems and Identify False-Positives

45. Because heuristic evaluations, which are designed to uncover potential problems, are subjective comparisons of an interface to a set of guidelines or heuristics, such an evaluation often identifies problems that do not actually exist in practice. Accordingly, any item identified by an individual evaluator should be considered a potential or candidate problem.²³ The potential usability problems identified via inspection-based techniques including heuristic evaluation will vary in importance. Some of the items identified will correspond to minor usability problems, causing little more than an occasional annoyance. Other items will correspond to severe usability problems, which may interfere with an individual's ability to complete a task. Importantly, items identified using heuristic evaluation have also been shown to be false-positives. In other words, some of potential problems identified by individual evaluators, including evaluators who are usability experts, will not represent real problems that need to be addressed.²⁴

46. A systematic process of reviewing the existence and severity of the potential problems, which also needs to include several individuals, is vital to address and eliminate false-positives while also distinguishing between issues that may produce little more than an occasional irritation and those that may cause severe problems for users.²⁵ Unlike usability tests, which rely on users interacting with the system and encountering problems, heuristic evaluation relies on

²² <http://www.nngroup.com/articles/how-to-conduct-a-heuristic-evaluation>.

²³ Cockton, Gilbert, and Alan Woolrych. "Understanding inspection methods: lessons from an assessment of heuristic evaluation." *People and Computers XV—Interaction without Frontiers*. Springer London, 2001. 171-191.

²⁴ Sears, Andrew. "Heuristic walkthroughs: Finding the problems without the noise." *International Journal of Human-Computer Interaction* 9.3 (1997): 213-234.

²⁵ <http://www.nngroup.com/articles/how-to-rate-the-severity-of-usability-problems/>.

individuals reviewing a system and identifying things they *think* may be problems. The nature of heuristic evaluation makes the problem severity rating process even more important.

47. The concern of false-positives has been in the forefront since heuristic evaluation was introduced. One of the original papers introducing the heuristic technique highlighted the potential for false-positives.²⁶ Other researchers subsequently confirmed the problem of false-positives and the importance of a separate process for reviewing problem severity in the context of heuristic evaluation.²⁷ Researchers have also demonstrated that heuristic evaluation can produce numerous potential problems that are not identified or corroborated through user testing.²⁸ Finally, Jakob Nielsen continues to highlight the critical importance of an effective severity rating process, stressing the importance of having several people independently review the severity of each potential problem.²⁹

4. Heuristic Evaluations Are Not a Substitute for Usability Testing

48. Ms. King states that the “overriding goal” of her heuristic evaluation is to “identify major flaws.”³⁰ She also says “a usability inspection [such as she performs] can provide similar insights to those generated through user testing, particularly when reviewing interfaces for conformance with basic principles.”³¹ Both of these statements raise serious concerns.

49. First, heuristic evaluations are *not* known or designed to focus on “major flaws.” As described above, heuristic evaluations identify a mixture of potentially severe problems, minor problems, and false-positives. Most often, the number of minor problems identified is far greater than the number of severe problems identified.

²⁶ Nielsen, Jakob, and Rolf Molich. “Heuristic evaluation of user interfaces.” Proceedings of the SIGCHI conference on Human factors in computing systems. ACM, 1990.

²⁷ Sears, Andrew. “Heuristic walkthroughs: Finding the problems without the noise.” International Journal of Human-Computer Interaction 9.3 (1997): 213-234.

²⁸ Law, Effie Lai-Chong, and Ebba Thora Hvannberg. “Analysis of strategies for improving and estimating the effectiveness of heuristic evaluation.” Proceedings of the third Nordic conference on Human-computer interaction. ACM, 2004; <http://www.nngroup.com/articles/usability-problems-found-by-heuristic-evaluation/>.

²⁹ <http://www.nngroup.com/articles/how-to-rate-the-severity-of-usability-problems/>.

³⁰ Expert Report of Jennifer King (October 16, 2015) at 14.

³¹ Expert Report of Jennifer King (October 16, 2015) at 14.

50. Second, the results produced by heuristic evaluations are not as reliable as those produced through user testing and do not necessarily produce similar insights.³² In fact, the reference Ms. King uses to support the assertion about the similarity of those results supports the *opposite* conclusion. Ms. King relies on Dana Chisnell's 2010 article titled "What you really get from a heuristic evaluation" for her similarity position,³³ but that article actually concludes otherwise.³⁴

51. Chisnell makes several statements that are in direct conflict with Ms. King's interpretation of Chisnell's work. Chisnell states, for example, that "[u]nfortunately, the request [by a client to do a heuristic evaluation of a product] usually suggests that a heuristic evaluation can substitute for usability tests." But Chisnell confirms that heuristic evaluation is "an inspection, *not* an evaluation. It is *not* about the user experience."³⁵ Chisnell further verifies that any such heuristic review that "claims to answer" questions about a user's actual experience "is just guessing." Chisnell also confirms that heuristic evaluations such as Ms. King's are likely to identify design problems that are not actually problematic: "Worse, they may identify things that don't comply with the heuristics that should *not* be changed."³⁶

52. Chisnell explains why Ms. King's individual, subjective heuristic evaluation inspection is unreliable in evaluating Amazon's in-app purchasing process: "Heuristic evaluation may help a team know whether their UI [user interface] complies with someone else's guidelines. But observing people using a design in a usability test gives a team primary data for making design decisions for their users using their design" Notably, Chisnell identifies touchscreen devices and online connectivity (the interfaces at issue here) as particularly susceptible to error from a heuristic evaluation: "[user testing is superior,] especially in a world evolved far beyond command line entry and simple GUIs [graphic user interfaces] to options like touchscreens, social media, and ubiquitous connectivity." As Chisnell concludes, "For me, observing people using a design will always trump an inspection or audit for getting solid evidence to determine a

³² <http://www.nngroup.com/articles/usability-problems-found-by-heuristic-evaluation/>.

³³ Expert Report of Jennifer King (October 16, 2015) at 14.

³⁴ Chisnell, Dana. "What you really get from a heuristic evaluation." UX Magazine, Feb. 19, 2010. <http://uxmag.com/articles/what-you-really-get-from-a-heuristic-evaluation>

³⁵ Emphasis added.

³⁶ Emphasis added.

design direction.” Heuristic evaluations can be useful, when applied properly, for determining if a system conforms to guidelines. But as Chisnell notes, the fact that something does not conform to a predefined set of guidelines does not mean that there is a problem that needs to be addressed.

C. Ms. King’s Heuristic Evaluation Is Incomplete and Unreliable

53. Ms. King’s report contains questionable conclusions drawn from an incomplete and unreliable heuristic evaluation. By conducting an individual, subjective evaluation in a vacuum with an “overriding goal” to “identify major flaws,” Ms. King uses an approach that is particularly susceptible to overemphasizing the severity of perceived problems and identifying false-positives. Ms. King’s conclusions were not informed or corroborated by user testing or user surveys, and she does not consider the fact that the overwhelming majority of customers used in-app purchasing without complaint.³⁷ Yet, Ms. King often draws sweeping, unqualified conclusions about wide swaths of tablet users without statistical support—opining that “many” customers would not understand in-app purchasing, that “many, if not most” customers would never see Amazon’s in-app-purchasing notices, that “many users were not likely to know that a free app would have any additional costs attached” (even though no additional costs were ever necessary to use the free apps at issue here), and that “in the majority of cases” Amazon’s badging alone must effectively convey the presence of in-app purchasing. Ms. King presents her own personal, broad opinions on these topics while discounting the judgments of Amazon’s team of web and tablet designers, who have considerable experience and real-world success improving user interfaces and user experiences.

54. Moreover, Ms. King’s analysis seems to erroneously assume that Amazon’s primary task is always to address in-app purchasing and Parental Controls. She often fails to recognize the variety of tasks at issue on each screen and how the various groups of potential users would perceive these tasks, particularly for a multimedia device designed to provide a multitude of services to a variety of customers. She fails to recognize that most Amazon customers prefer a frictionless purchasing experience unencumbered by additional dialog boxes and password prompts.³⁸ She often ignores her own opinion that adding more text likely means that users will

³⁷ Expert Report of Ravi Dhar (October 16, 2015) ¶¶ 103-07 & Table 2.

³⁸ Expert Report of Donna Hoffman (October 16, 2015) ¶¶ 55-64, 73-76.

skim the text rather than read it. And, Ms. King’s analysis focuses almost exclusively on the most uninformed user who is unwilling to make any effort to understand the purpose and ability of the purchased tablet device. Indeed, she goes so far as to conclude that the term “real money” only “subtly” conveys the use of actual currency and that the term “future in-app purchases” is “vague.”

55. Ms. King similarly ignores the fact that Kindle Fire tablets are media-consumption devices, which necessarily implies some purchasing ability via that device—an understanding that is reinforced by the fact that device owners must first link the tablet to an Amazon credit-card account before making any purchase on the device. In other words, Ms. King assumes that the average Kindle Fire account owner is unaware that his or her device, once enabled for credit-card charges, could be used by another user for credit-card purchases. That is not a reasonable assumption because ownership of such an account-connected device should and likely would prompt at least of a modicum of vigilance by tablet owners, particularly parents. In my opinion, it was reasonable for Amazon to proceed on the understanding that users, particularly parents, would not simply hand an Internet-connected and credit card-enabled device to children without any supervision over purchases. It was and remains a reasonable design choice to build into such devices parental choice and regulation, which is what Amazon provided via its notices and Parental Controls (and later via FreeTime).³⁹ Ms. King ignores this context and reaches a conclusion that is based on the far less reasonable assumption that Kindle Fire account owners would exercise almost zero supervision or responsibility over how others, particularly children, used their devices once enabled for purchases over the Internet.

56. Nor does Ms. King clearly identify to what standard she holds Amazon. She appears to demand a level of perfection or “best” practice from inception of the product, with the aid of hindsight, that is uncalled for in the industry or in the academic literature. No single evaluator can effectively and reliably determine a best practice, particularly in a developing market with a developing interface. The field of human-computer interaction does not recognize a single standard for best practices or even for complete “effectiveness.” Ms. King’s approach is

³⁹ Business planning documents for the Amazon Appstore indicate that Amazon early on identified Parental Controls as a tool available for parents who would supervise their child’s use of a device. Amazon_265968-70, Amazon_265973, Amazon_265968, Amz_FTC_0037659.

inappropriate here where the question is whether Amazon's practices were unfair, not whether they were imperfect. Indeed, Ms. King's unqualified conclusions provide an inaccurate and inappropriate description of the tablet market, and her analysis fails to consider the state-of-the-art or industry practice when Amazon launched opportunities for in-app purchasing and introduced various interfaces over time. She similarly disregards whether Amazon's approach was reasonable even if not "best," whether it was part of a refinement process that employed data and information from actual user experience and feedback with the goal of continuously improving the user experience, or whether it was made in good faith and not intended to deceive.

57. As a result, Ms. King produces a collection of potential or candidate problems of uncertain reliability and unknown severity, and her solutions, where suggested, do not adequately consider context, show little or no appreciation for competing design objectives, and could introduce unaddressed and unintended consequences. Some of these candidate problems are likely false-positives. Even those items that are not false-positives simply correspond to items that deviate from a set of guidelines, and those "deviations" do not necessarily mean that changes to the system are appropriate or that users would experience difficulty as a result of the issues identified. The following examples highlight why multiple, professional evaluators are necessary when applying such usability inspection techniques.

1. Prominence of In-App Purchase Disclosures

58. Beginning less than a week after Amazon first started offering opportunities for in-app purchasing, Amazon included on the app-description page information about in-app purchases allowing users to understand the meaning of in-app purchasing and to understand that Parental Controls were available for use in the context of in-app purchases. This information was appended to the end of the app description, highlighted by the uppercase text "PLEASE NOTE." The note itself informed users that the "app contains in-app purchasing, which allows you to buy items within the app using actual money." That text clearly and in understandable terms states that purchases can be made from within the app and that these purchases are made using real or "actual" money. The note continues by informing users that they "can configure parental controls from the device Settings menu by selecting Parental Controls." That text also clearly and in

understandable terms informs users that they have the ability to enable Parental Controls via the settings menu.

59. In my opinion, and contrary to Ms. King's view, in the context in which it was encountered, the phrase "in-app purchase" was sufficiently clear. Moreover, because the device is connected to the account holder's Amazon account, which includes a method of paying for purchases such as a credit card, it is reasonable to expect users to understand that these "in-app purchases" would result in charges to their Amazon account.

60. The use of uppercase to highlight "PLEASE NOTE" makes the in-app purchase note more prominent than it would be otherwise. The fact that the app developer could also use uppercase within the app description does not change this fact or completely eliminate its usefulness, as Ms. King suggests. There can be multiple important pieces of information within the app description including the in-app purchase note and other items identified by the app developer. The use of uppercase would help to attract the users' attention to these items that were considered important.

61. Nor did Ms. King identify any instance in which uppercase was used so often that it was no longer a distinguishing feature. And had Amazon made the entirety of the in-app-purchase note uppercase (as opposed to the attention-grabbing first two words), it may have been more difficult for users to read and they may have then, as Ms. King notes, only skimmed or completely ignored the text.

62. Ms. King opines that "in the majority of cases," users would not see or understand the in-app-purchase description, yet she performed no user testing or statistical measurement to draw such a conclusion. And there is simply no support for Ms. King's unqualified position that because other text may have also been displayed in uppercase, the in-app-purchase text was "difficult, if not *impossible*, to notice" and was categorically "ineffective."⁴⁰

63. Finally, Ms. King ignores the simple fact that not all notices and information can be prominent. Not everything can be distinct, else everything becomes indistinct. Tradeoffs regarding importance and placement must be made. Everything cannot always appear "above the

⁴⁰ Expert Report of Jennifer King (October 16, 2015) at 26 (emphasis added).

fold,” nor should it. It was reasonable and fair and consistent with industry norms for Amazon to conclude that the most important information on the app-description page, and that which appeared at the top of the screen, describe the purpose and use of the app itself. In-app purchasing is optional and supplemental; its prominence should be commensurate with that significance. And Amazon reasonably adjusted that prominence as the significance of in-app purchasing also evolved in the market.

2. Prominence and Clarity of Key Details Badge

64. The Key Details badging was added in June 2013 as an additional means of highlighting important or useful information. As Ms. King notes, the Key Details were “Above the fold,” making them even more visible than other text when the app description is initially displayed. The bulleted list makes it clear that this is a list of topics and not the complete details. The Key Details label is presented in a color and font similar to other text on the screen, and the words effectively convey that this section includes important information.

65. Ms. King asserts that the title suggests that the section contains information the user “may wish to know” but that it “does not communicate to the user who is concerned about the cost of the app that it contains information that he or she must know regarding potential charges prior to downloading or using the app.” I disagree. The title “Key Details” is a useful way to highlight important details, particularly as users would understand that the term “Key” is synonymous with “important.” The purpose of the title was not, as Ms. King suggests, to specifically “communicate to the user who is concerned about the cost of the app that it contains information that he or she must know regarding potential charges prior to downloading or using the app.” The purpose of the title was to highlight the availability of important information or “key details.”

66. I also disagree with Ms. King’s analysis of the text provided for the In-App Purchases key detail. This text clearly and in understandable terms conveys that “actual money” is used, that purchases can be made from within apps, and that you can configure these purchases from within Parental Controls. I disagree with her assertion that the notice does not convey the “fact that IAPs have real costs associated with them.”

67. Ms. King states that users must already be familiar with the term “in-app purchasing” for “the element to be immediately effective.” I disagree. The choice of words makes it such that the phrase clearly refers to a “purchase” in the context of an “app” or gives the reasonable parent enough information to inquire further about the type of purchasing at issue.

68. Ms. King does not offer alternatives or consider the unintended consequences of implementing those alternatives. With respect to the Key Details badging and implicit throughout Ms. King’s report is the contention that Amazon should have added more text and more notices to describe in-app purchasing and Parental Controls in greater detail. But even she admits that “people prefer to skim, rather than read lengthy amounts of text” and that additional “task interruption [that diverts attention from the primary task, e.g., selecting and using the app] is a powerful disincentive.”⁴¹ Ms. King makes no effort to reconcile those inconsistent positions or address the balance required to most efficiently give all users, including parents and nonparents, the information and tools to make informed decisions about their devices and the individuals they permit to use those devices.

3. Clarity of In-App Purchase Disclosures

69. Ms. King asserts that it is important to disclose “in-app purchases in a brief and concise statement.” She also asserts “given the fact that in-app purchases can quickly become quite costly, the importance of communicating their cost is crucial.” However, her two assertions can be in conflict since it may be difficult to “communicat[e] their cost” in a “brief and concise statement” due to the potential for multiple, different in-app purchases with different costs within a single app. And she often criticizes Amazon for using brevity and conciseness in its notices. Given the trade-off, it is important that the message be brief; otherwise, as Ms. King has noted, people may be less likely to read to notice.

70. Ms. King argues that the use of the phrase “parental controls” was “likely to introduce confusion or an additional learning barrier for novice parents or users who are not parents attempting to familiarize themselves with the system.” She draws her conclusion from her assertion that the term “parental controls” was originally introduced in the context of content

⁴¹ Expert Report of Jennifer King (October 16, 2015) at 24, 38.

blocking and “purchase controls did not emerge until the late 2000s.” Thus, according to Ms. King, for some unidentified portion of the user population “pre-existing familiarity with the term may trigger primary associations with content restriction rather than purchase restrictions.” Ms. King’s evaluation of the understanding of the term “parental controls” (particularly as late as November 2011) is unnecessarily and incorrectly narrow. Reasonable users would understand the term “parental controls” to refer to *restrictions* set up by parents—a restriction to content or a restriction to purchasing, or both. Much like the definition of the term “in-app purchasing” is self-evident, so too is the term “parental controls,” particularly in this context.

71. Ms. King appears to ignore common sense while focusing exclusively on only the most uninformed users who are unwilling to make any effort to understand the purpose and capabilities of the device they purchased. There is of course the possibility that “some” users will not understand the term “parental controls,” just as there is the possibility that some users will not understand any term or notice. Any interface design and any choice of words can result in “some proportion of the user population” misunderstanding some details; that possibility cannot be avoided, especially where a company must balance the needs and desires of many varied customers. Ms. King demands a level of perfection that is both unjustified and nonexistent. That *some* users *may* not have understood that commonly used and widely understood term does not make its use “ineffective.”⁴²

4. Usability of In-App Purchase Flow and Disclosures

72. In May 2013, even though only a small percentage of users were experiencing any misunderstanding about in-app purchases, Amazon introduced a password prompt on each device for all first-time in-app purchases. That dialog box not only required entry of the account holder’s password to complete the purchase but also further explained in-app purchases; reiterated that if the account holder wanted to require a password for future purchases, he or she

⁴² Ms. King also ignores that Amazon and its Appstore provide unfiltered customer reviews on every app-detail page. Those reviews, which are a widely recognized source of useful information, include commentary (both positive and negative) about the availability of in-app purchasing and Parental Controls. *See* Expert Report of Michael Callahan (October 16, 2015) at 10. By making available not just many reviews but all reviews (critical and otherwise), Amazon’s design choice helps train customers to use those reviews as a source of information. Ms. King fails to consider that context.

should set up Parental Controls; and provided a direct hyperlink to enable those parental-control settings.

73. Despite this effort by Amazon to again convey both the opportunity for in-app purchases and the ability to disable them (creating additional friction unwanted by most of its customers in order to help those customers who may have needed additional assistance), Ms. King identifies “at least three” issues with the dialog box. She first observes that “the call to action (entering a password) dominates the focus of this prompt and suggests the other text is less important.” Ms. King ignores the fact that the password prompt immediately above the space for entering the password says, “To complete your *purchase*, enter your Amazon password.” The wording of the prompt conveys to the account holder that someone is making a purchase on the device, and this is the primary purpose of the dialog box. Moreover, the title of the dialog box, which is presented in larger font size than any other text, also says, “Confirm In-App *Purchase*,” prominently verifying for the account holder that password entry will result in a purchase. These are reasonably the most important aspects of the dialog box, and they are made sufficiently clear to the user.

74. Second, Ms. King suggests that users would not understand the phrase “real money” because it appears “without mentioning the dollar amount of the particular charge or using a dollar signs or other signals to emphasize that there is a financial transaction.” I strongly disagree with Ms. King’s analysis. The lack of dollar signs or a specific dollar amount on this dialog box would not cause the reasonable user (or even an uninformed user) to misunderstand that he or she would be spending money by completing the transaction.

75. Finally, Ms. King opines that the phrase “future in-app purchases” is vague such that “even users familiar with in-app purchases are unlikely to understand that after entering their password a child would be able to incur additional in-app charges without password reentry.” I disagree. She asserts that users who “read the full sentence” may “fail to understand that they must change their device settings to prevent children from incurring additional in-app charges without password entry” because the “If you’d like” at the beginning of the sentence characterizes the information as optional. I disagree. I believe this sentence presents the user with clear instructions in the form widely accepted formula: if GOAL then ACTION. If the user

would like to require passwords for future in-app purchases, they must “turn on Parental Controls.” The standard by which Ms. King evaluates this dialog box, as well as other prompts, is unreasonably demanding, unsupported by academic literature, and implies that no phrase would ever be sufficient.⁴³

5. Prominence and Clarity of Purchase Confirmation Screen

76. Ms. King critiques the “Purchase Confirmation Screen,” asserting that “When Amazon required password entry, some parents may not have seen this screen after entering their password and handing the device back to a child.” Her critique misses the point. By presenting a confirmation dialog box, Amazon provided the opportunity for users to confirm their transaction. It is always possible that someone may not notice such a confirmation if they quickly hand the device to someone else, but this does not negate the fact that Amazon provided users with an opportunity to confirm their transaction.

77. Ms. King also asserts that “Other parents may have seen the screen, but may not have read the text [about Parental Controls] given that the primary call to action is the close button in the top right.” Again, this is always a possibility when a screen is designed to address multiple goals. In this case, the primary goal is to confirm a transaction. A secondary goal was to convey the status of the Parental Controls, providing users with yet another opportunity to verify and modify the status of these controls. Ms. King’s analysis seems to assume that the primary task is always to deal with the Parental Controls related issues, failing to recognize the variety of tasks supported by this dialog box and which tasks were considered most important for the majority of users.

6. Ms. King’s Analysis of Customer-Service Contacts Is Flawed

78. Ms. King’s analysis of customer-service contacts is likewise flawed and suffers from the same defect of searching for and highlighting information that supports a theory rather than evaluating usability objectively. In particular, Ms. King began with over 152,000 “records of

⁴³ Notably, Ms. King highlights Nielsen’s position that it is best practice to disclose additional fees as soon as possible. Expert Report of Jennifer King (October 16, 2015) at 20-21. But she ignores that Amazon in multiple locations disclosed—before even downloading an app and long before making any in-app purchase—that opportunities for in-app purchasing were available and optional. Amazon also disclosed every specific fee before the user made a purchase.

individual consumer complaints corresponding to certain Amazon complaint codes.” But this entire set of records was *predisposed* to represent situations where customers raised concerns, thus deliberately reinforcing the existence of her allegedly uncovered “themes.” Importantly, Ms. King provides no information or analysis regarding the total number of transactions during this period of time, limiting the ability to understand the prevalence of concerns based on this source of information alone.

79. Moreover, Ms. King pruned those records to approximately 28,000 records of chat sessions and emails that included the phrase “Accidental Order – Child.” By limiting the sample to only those contacts with the term “Accidental Order – Child,” Ms. King necessarily restricted her analysis to records predisposed to support her “themes” about accidental orders made by children—to the exclusion of contacts made by all Amazon customers about in-app purchases let alone the total number of in-app purchases that occurred during this period.

80. Taking a random sample of that focused subset of records, Ms. King manually reviewed 400 records, identifying a smaller subset of 219 records she deemed “informative” because the customer *explicitly noted* that the basis of the complaint was an unintentional order for an in-app purchase by a child.”⁴⁴ It should come as no surprise that Ms. King discovered “themes” about accidental child purchases when her analysis *began* from a highly filtered set records consisting of just over 0.1% of the total customer contacts.

81. Further, it is unreliable to draw meaningful conclusions based on approximately 20 self-selected quotes at the end of this process. Moreover, she presented the quotes without context. Ms. King provides no analysis of the outcomes for these interactions or the prior online and tablet shopping experiences for those customers. Understanding outcomes and customer history is critical because it speaks to the user experience and the satisfaction of the user after they contacted Amazon.

82. Nor does Ms. King identify how many of the 400 randomly selected records supported each of her “themes.” As presented, no theme was supported by more than five quotes and two were supported by just two quotes. Approximately 2.28% of the 219 selected records were presented in support of the most common themes, but a more appropriate analysis would focus at

⁴⁴ Emphasis added.

least on the 400 randomly selected records, in which case only 1.25% of the records supported the most common themes. Even then, however, those records were carefully selected by Ms. King from the broader set of over 152,000 records and this full collection of over 152,000 records represents just a fraction of the total in-app purchases during this period.

83. Finally, different conclusions can be drawn from even those limited quotes Ms. King selects. For example, Ms. King relies on the quote, “my 5 year old was playing a free game on my kindle and apparently unlocked sections of the game that you have to pay for” to support her conclusion that “some customers assumed that a free app would not have a component that allowed for paid purchases.” But that selected quote can just as easily support the inference that the consumer already understood that free games could have “sections of the game that you have to pay for” when unlocked and chose to disregard the available controls to prevent accidental purchases when providing the device to a child.

D. Amazon Designed for Parents to Exercise Control Over Their Devices

84. Ms. King emphasizes the need for parents to be able to control their children’s use of credit-card-enabled devices, yet she ignores the design objectives and strategies that Amazon employed when creating in-app purchasing for Amazon customers. The earliest consideration of design objectives on the part of Amazon Appstore engineers and business leaders acknowledged that parents would want the functionality to effectively control their children’s ability to make purchases on an account-connected device, while simultaneously wanting the freedom to allow their children access to such devices. Those customer needs were fully anticipated, and the Amazon designers and planners included those objectives in their plans.

85. For instance, as early as May 2011, months before in-app purchasing was first introduced, Amazon’s design team circulated a Business Requirements Document that set forth the proposed roadmap for in-app purchasing and the design objectives that had been identified.⁴⁵ Under the heading “Customer Needs,” Amazon’s designers and planners observed that “Parental Control” would be desired by parents, stating, “Adults buying for children (or enabling their children to buy for themselves) will want the ability to guard against large, unexpected charges -

⁴⁵ Dep. Ex. 47, Deposition of A. Paleja (July 14, 2015).

e.g. through addition of a PIN requirement or spending limits.”⁴⁶ Ms. King ignores the fact that Amazon built into its design the tools necessary for responsible parents to exercise the supervision that they desired by “opting in” to enable Parental Controls.⁴⁷

E. Dr. Rosenberg’s Usability Test

86. As discussed above, a heuristic evaluation is not a substitute for usability testing, which has the advantage of directly observing and evaluating users’ interaction with an interface. It is my opinion that a usability test would provide relevant information about the conclusions I have reached.

87. On December 4, 2015, after I had formulated my opinions discussed above, Amazon’s counsel informed me that another expert, Craig Rosenberg, Ph.D., had performed a usability test in this case. I requested the opportunity to review it and did so.⁴⁸ Based on my review of the Rosenberg test, I have the following additional observations and opinions regarding how it relates to the opinions I independently reached:

- a. Dr. Rosenberg’s test is the type of usability test that I would find useful when evaluating a user-interface design.
- b. Findings in Dr. Rosenberg’s test buttress many of my opinions identified above. For example:
 - i. Nearly all test subjects viewing an app-description page understood that it was possible to incur additional charges within an app that offered in-app-purchasing opportunities;
 - ii. All or nearly all test subjects understood the language used in the “PLEASE NOTE” and Key Details notices relating to in-app purchasing and Parental Controls, and nearly all subjects understood that they could set Parental Controls to limit in-app purchases; and

⁴⁶ Ibid. at 00265969.

⁴⁷ Ibid. at 00265976.

⁴⁸ Expert Report of Craig Rosenberg (December 7, 2015).

- iii. Nearly all test subjects understood the language used in the dialog box introduced in May 2013 for first-time in-app purchases relating to in-app purchasing and Parental Controls, and nearly all subjects understood the dialog box presented the option of requiring a password for future in-app purchases.⁴⁹

IV. Conclusion

88. Heuristic evaluations of user interfaces are subjective and, particularly when limited to a single evaluator, are prone to overestimate the number and severity of potential problems. It is my opinion that the heuristic evaluation by Jennifer King is an incomplete analysis and draws unreliable conclusions. Contrary to Ms. King, I conclude that Amazon's initial design and refinement of its user interface relating to in-app purchasing were reasonable and consistent with the practice of the industry. They did not fall so far below contemporary, accepted business practices that they would have unfairly confused parents about the presence of and opportunity to make in-app purchases, about the presence of and opportunity to enable Parental Controls to restrict in-app purchases, or the availability of and means to request a refund for any accidental or unwanted in-app purchases.

Dated December 7, 2015

Andrew L. Sears, Ph.D.

⁴⁹ The test results revealed similarly positive results for the version of the dialog box introduced in June 2014.

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Dated December 7, 2015



Andrew L. Sears, Ph.D.

⁴⁹ The test results revealed similarly positive results for the version of the dialog box introduced in June 2014.

Appendix A: Curriculum Vitae of Dean Andrew Sears

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Education

Ph.D., Computer Science. University of Maryland-College Park, May 1993

B.S., Computer Science. Rensselaer Polytechnic Institute, May 1988

Experience

Sept 2015 – Present	Interim Chief Information Security Officer, The Pennsylvania State University
July 2015 – Present	Professor and Dean, College of Information Sciences and Technology, The Pennsylvania State University
Aug 2011 – June 2015	Professor and Dean, B. Thomas Golisano College of Computing and Information Sciences, Rochester Institute of Technology
Aug 2008 – July 2011	Constellation Professor of Information Technology and Engineering, UMBC
Dec 2007 – Nov 2010	Professor of Research, US Department of Veterans Affairs
Oct 2007 – June 2013	Professor of Anesthesiology, University of Maryland, School of Medicine
Oct 2005 – July 2008	Associate Director, National Center for the Study of Elections, UMBC
Aug 2005 – July 2011	Affiliate Professor, Erickson School of Aging Studies, UMBC
July 2003 – July 2011	Professor, Information Systems Department, UMBC
July 2002 – July 2011	Chair, Information Systems Department, UMBC
Sept 2002 – June 2005	Member, Bioinformatics Research Center, UMBC
July 2001 – July 2002	Graduate Program Director, Information Systems Department, UMBC
Oct 2001 – July 2011	Director, Interactive Systems Research Center, UMBC
July 1999 – July 2003	Associate Professor, Information Systems Department, UMBC
July 1993 – June 1999	Assistant Professor, School of Computer Science, Telecommunications and Information Systems, DePaul University
Aug 1988 – July 1993	NASA Fellow/Research Assistant, Human-Computer Interaction Lab, Computer Science Department, University of Maryland – College Park.

Oct 1990 – July 1993 Software Engineer, NASA Goddard Space Flight Center, Greenbelt, Maryland

May 1990 – Aug 1990 Usability Engineer, Sun Microsystems, Billerica, Massachusetts

Prior Testimony

In the Matter of Certain Mobile Handset Devices and Related Touch Keyboard Software,” Investigation number 337-TA-864, U.S. International Trade Commission.

Publications

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- Cohen, M., Dringus, L., Sears, A., and Hornstein, S. (1995). Increasing collaboration between industry and academia in HCI education, *SIGCHI Bulletin* (pp. 29-30), Volume 27, Number 4, New York: ACM.
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Select Research Support

10/10 – 9/11	NIST (iDoxSolutions)	Voting System Dexterity Analysis	PI	\$45,744
9/10 – 8/11	NSF	Accessible Electronic Health Records: Defining a Research Agenda	PI	\$24,747
10/09 – 9/12	US Department of Education, NIDRR	Cognitive decline, work, and technological interruptions	PI	\$180,000

7/09 – 6/10	MD Commission on Community Health	IT support for community health	PI	\$49,684
6/09 – 6/10	MD Judiciary, Office Of Communications and Public Affairs	Web design: Information Architecture, Accessibility, and New Technologies	PI	\$120,000
4/09 – 3/10	IBM	Interruption recovery in an aging workforce: The role of cognitive abilities and visual cues	PI	\$40,000
2/09 – 1/10	MD Department of Transportation – State Highway Administration	Anomaly detection for traffic management data	Co-PI	\$53,580
1/09 – 12/09	Quality Assured Services	Consortium for Information Technology and Health Outcomes Research (CITHOR)	Co-PI	\$40,000
7/08 – 6/09	MD Commission on Community Health Resources	IT support for community health	PI	\$49,684
7/08 – 1/09	Department of Veterans Affairs	Evaluation of a web based Multiple Sclerosis education	Co-PI	\$67,500
9/07-9/08	Para Consulting (VA funding)	Healthcare and computer assisted education	Co-PI	\$23,616
9/07 – 6/08	MD Commission on Community Health Resources	IT support for community health	PI	\$93,999
9/07 – 9/08	Para Consulting (VA funding)	Multiple Myeloma VA Education Program	Co-PI	\$62,395
5/07 – 4/08	State of Maryland Board of Elections	Maintaining and supporting website mdelections.umbc.edu	Co-PI	\$125,913
1/07 – 12/09	NSF	MRI: Acquisition of equipment to establish a research Infrastructure to support HCI and UA research	PI	\$180,000
9/06 – 8/07	NSF	Human-centered computing: Defining a research agenda	PI	\$47,212
2/06 – 12/06	State of Maryland Board of Elections	Candidates Database	Co-PI	\$63,460
2/06 – 12/06	State of Maryland Board of Elections	Campaign Finance Database	Co-PI	\$138,468
2/06 – 8/06	State of Maryland Board of Elections	Electronic Voter Interfaces	PI	\$57,176

2/06 – 1/07	NSF	Consortium on IT accessibility	PI	\$28,766
12/05 – 11/08	US Department of Education, NIDRR	Optimized Hands-Free Speech Recognition	PI	\$449,653
11/05 – 4/06	The Paciello Group	FEMA web site usability study	PI	\$8,117
11/05	The Verizon Foundation	IT accessibility research	PI	\$25,000
8/05 – 1/06	State of Maryland Board of Elections	State Elections Board Technical Evaluation	Co-PI	\$114,800
6/05	IBM	Increased accessibility thorough speech-based interactions for mobile technologies	PI	\$30,000
6/05 – 5/07	NSF	Consortium for research on accessible computing	PI	\$28,673
3/05 – 2/06	NSF	IT-Oriented Functional Assessments	PI	\$99,320
6/04	IBM	Increased accessibility thorough speech-based interactions for mobile technologies	PI	\$40,000
8/04 – 8/07	US Department of Education	Graduate Assistantships in Areas of National Need	Co-PI	\$622,665
9/03 – 8/06	NSF	Using speech recognition to enhance communication capabilities for individuals with physical disabilities	PI	\$408,902
4/03 – 3/06	NSF	REU Site: Human-Computer Interaction	Co-PI	\$236,146
9/02 – 8/03	NSA	Visualization for intrusion detection	Co-PI	\$149,827
9/02 – 8/03	NSA	Visualization for intrusion detection: Identifying promising research directions	Co-PI	\$99,862
9/01 – 8/06	NSF	Universal access for situationally induced impairments	PI	\$1,050,020
9/01 – 8/06	NSF	REU Supplement: Universal access for situationally induced impairments	PI	\$33,000
1/01 – 12/01	Aether Systems, Inc.	Speech recognition based data entry for handheld mobile computing devices	PI	\$93,320
3/01 – 2/02	NSF	Human-Computer Interaction Doctoral Research Consortium	Co-PI	\$30,000
9/99 – 8/03	NSF	Using speech recognition to enhance communication capabilities for individuals with disabilities	PI	\$456,284
9/99 – 9/04	Motorola, Inc.	Text input methods for hand-held devices	PI	\$105,034

6/99 – 12/99	Intel Corporation	Exploring system performance, cognitive demands, interface design and user productivity	PI	\$12,650
10/98 – 12/99	Platinum Technologies	Software for assessing system response time and user productivity	PI	\$81,750
4/98 – 12/99	Intel Corporation	Exploring the relationship between system performance and user productivity	PI	\$122,213
4/97 – 3/98	Microsoft Corporation	The impact of internet delay and document content on user perceptions	PI	\$17,887
9/91 – 5/93	NASA	Layout Appropriateness: Guiding user interface design with simple task descriptions	PI	\$44,000

Select Editorial Activities

- Member of Editorial Board, *ACM Transactions on Accessible Computing* (2013-present)
- Associate Editor, *ACM Transactions on Computer-Human Interaction* (2011 – present)
- Associate Editor/Member of Editorial Board, *European Journal of Information Systems* (6/2009-12/2012)
- Member of Editorial Board, *International Journal of Human-Computer Studies* (2008 – present)
- Member of Editorial Board, *International Journal of Mobile Human-Computer Interaction* (2008-2010)
- Editor-in-Chief (with Vicki Hanson), *ACM Transactions on Accessible Computing* (2006-2013)
- Co-Editor, Special issue of *ACM Transactions on Computer Human Interaction* (2006)
- Co-Editor, Special issue of *Behaviour and Information Technology* on Accessible Computing (2005)
- Member of Editorial Board, *Journal of Organizational and End User Computing* (2003 – 2007)
- Member of Editorial Board, *International Journal of Human-Computer Interaction* (2001 – 2009)
- Member of Editorial Board, *Universal Access in the Information Society* (2000 – 2015)
- Editor, Special Issue of the *International Journal of Human-Computer Interaction* on Empirical Studies of WWW Usability (to be published as issue 12(2) in 2000)
- Guest Editor (with Arnold Lund) for a Special Issue of *IEEE Software* on Creating Effective Interfaces, Volume 14, Number 4 (July/August 1997)

Select Conference Committee Activities

- Co-chair, Technical Program, International Conference on Multimodal Interaction, 2013
- Associate Chair, Program Committee, ACM Conference on Computer Human Interaction 2012
- Judge, Student Research Competition, ASSETS 2011
- Associate Chair, Program Committee, ACM Conference on Computer Human Interaction 2011
- Associate Chair, Program Committee, ACM Conference on Computer Human Interaction 2010
- Judge, Student Research Competition, ASSETS 2008
- Co-chair, Doctoral Consortium, Assets 2006
- Conference Chair, Assets 2005
- Chair, Program Committee, Assets 2004
- Registration Chair, ACM Conference on Universal Usability 2003
- Publicity Chair, Assets 2002. Responsible for all publicity for the conference.
- Conference and Technical Program Co-Chair, CHI 2001. Responsible for committee selection (approximately 35 volunteers and 20 professional staff), budget development (over \$2.2 million), and managing all logistical and technical aspects of the conference. CHI is the premier conference on human computer interaction and regularly attracts over 2500 attendees.
- Associate Chair, Program Committee, ACM Conference on Universal Usability 2000.
- Student Volunteers Co-chair, CHI 99. Responsibilities: Organize, schedule, and oversee 150 volunteers
- Tutorials Co-chair, CHI 98. Responsibilities: Run review process, select tutorials, deal with all logistical concerns, oversee tutorials program. The tutorials program traditionally makes approximately ½ of the revenue

for the conference. The tutorials program included 36 tutorials over 3.5 days and resulted in approximately 3500 ½ day tutorial units being sold. This was one of the most successful tutorials programs at any CHI conference.

- Doctoral Consortium Faculty Advisor, INTERACT'99.

Select Awards/Honors

- ACM Distinguished Scientist, 2010
- SIGACCESS Recognition of Service Award for serving as Conference Chair of Assets 2005, 2005
- SIGACCESS Recognition of Service Award for serving as Program Chair of Assets 2004, 2004
- Best Paper Award, Hawaii International Conference on Systems Science, Internet and Digital Economy Track, 2005
- SIGCHI Recognition of Service Award for serving as Chair of CHI 2001, 2001
- SIGCHI Recognition of Service Award for Chairing the Chicago Area Chapter of SIGCHI, 1999
- SIGCHI Recognition of Service Award for serving as Tutorial Chair for CHI 1998, 1998
- Selected to participate in the CHI 1992 Doctoral Consortium, 1992

Other

- Organizer, CHI 2011 Workshop on Data Driven Accessibility with L. Findlater, K. Gajos, A. Hurst, S. Trewin, and J. Wobbrock (May 2011).
- Organizer, CHI 2002 SIG on "User involvement in the web development process." With Jonathan Lazar – Towson University, Julie Jacko – Georgia Institute of Technology, and Julie Ratner (April 2002).
- Conducted a workshop at CHI 2000: "A Compendium of Practical Techniques for HCI Instruction." With Marian Williams – University of Massachusetts – Lowell (April, 2000)
- Co-chair and founder of the ACM SIGCHI Educational Resource Development Group (June 1996 – May 1998)
- Member, ACM SIGCHI International Advisory Task Force
- Organized and moderated the panel at CHI 98: "Famous HCI Educators Tell All" with Marian Williams - University of Massachusetts – Lowell (April, 1998)
- Panelist at HFWeb 3 - The Third Conference on Human Factors and the Web. "Web Usability: Search for a yardstick." Organized by Jean Schotz – NIST (June, 1997)
- Organized and moderated the panel at CHI 97: "None of the above: What's really essential in HCI Education?" with Marian Williams - University of Massachusetts – Lowell (March 1997)
- Conducted workshop at CHI 96: "Educating HCI Practitioners: Evaluating what industry needs and what academia delivers." with Mary Czerwinski, Laurie Dringus, and Barbara Bernal Thomas (April, 1996)
- Conducted workshop at CHI 95: "Increasing collaboration between industry and academia in HCI education." With Maxine Cohen, Laurie Dringus, and Susan Hornstein (May, 1995)
- Participant in workshop at CHI 94: "Designing the teaching of HCI." Organized by Jonas Lowgren, Clark Quinn, Jean Gasen, and Peter Gorney (April 1994)
- Conducted workshop at ACM SIGUCCS '89.: "Hypertext Workshop." (October 1989)

Select Service

- 2013-Present, Member, USACM (ACM US Public Policy Council) Accessibility Committee
- 2013-2015, Member, Board of Trustees, AI Sigl Community of Agencies
- 2011-2014, ACM SIG Governing Board Representative to the ACM Council
- 2010-2012, Vice Chair for Operations, ACM Special Interest Group Governing Board Executive Committee
- 2009 – 2012, Member, ACM Special Interest Group Governing Board
- 2009 – 2015, Chair, ACM SIGACCESS
- 2006 – 2009, Member, Steering Committee, Maryland Governor's Workforce Investment Board, IT industry workforce initiative
- 2006 – 2009, Vice chair, ACM SIGACCESS
- 2005 – 2015, Member, Assets Conference Steering Committee, ACM SIGACCESS
- 2001 – 2006, Secretary/Treasurer, ACM SIGACCESS
- 1997 – 1999, Founding Chair, Chicago area Chapter of ACM SIGCHI

Appendix B: Materials Considered

- Expert Report of Ravi Dhar (October 16, 2015)
- Expert Report of Donna Hoffman (October 16, 2015)
- Expert Report of Michael Callahan (October 16, 2015)
- Expert Report of Jennifer King (October 16, 2015)
- Expert Report of Daniel Hamermesh (October 15, 2015)
- Expert Report of Craig Rosenberg (December 7, 2015)
- Amazon_00265966-77; Amz_FTC_0037648-66; Amazon_00008749-00008892; Amazon_00290192-00290446; Amazon_00385350-00385372.
- Deposition Ex. 189 (M. Harbut)
- Deposition transcript of Ryan J. Kortekaas (July 23, 2015)
- Deposition transcript of Ameesh Paleja (July 14, 2015)
- *In re Apple Inc.*, Dkt. No. C-4444, Complaint, Federal Trade Commission (Mar. 2014) (FTC_AMZ_00000001)
- *In re Google Inc.*, Dkt. No. C-4499, Complaint, Federal Trade Commission (Dec. 2014) (FTC_AMZ_00000025)
- Amazon Memorandum to Federal Trade Commission (May 30, 2014)
- Amazon Presentation to FTC, Part 2 (In-App Purchasing at Amazon A Discussion with the Federal Trade Commission) (Jun3 2014)
- Device and Feature Specifications, <https://developer.amazon.com/appsandservices/solutions/devices/kindle-fire/specifications/01-device-and-feature-specifications>.
- Fire tablet, 7" Display.
- Potter, Richard L., Linda J. Weldon, and Ben Shneiderman. "Improving the accuracy of touch screens: an experimental evaluation of three strategies." Proceedings of the SIGCHI conference on Human factors in computing systems. ACM, 1988
- Sears, Andrew, and Ben Shneiderman. "High precision touchscreens: design strategies and comparisons with a mouse." International Journal of Man-Machine Studies 34.4 (1991): 593-613
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- Hartson, R., & P.S. Pyla, *The UX Book: Process and guidelines for ensuring a quality user experience*, Elsevier (2012)
- Nielsen, Jakob. “Finding usability problems through heuristic evaluation.” *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '92)*, ACM, New York, NY, USA, 373-380.
- Shneiderman et al., *Designing the User Interface: Strategies for Effective Human-Computer Interaction*.
- <http://www.nngroup.com/articles/how-to-rate-the-severity-of-usability-problems/>
- <http://www.nngroup.com/articles/how-to-conduct-a-heuristic-evaluation>
- <http://www.nngroup.com/articles/usability-problems-found-by-heuristic-evaluation/>.
- <http://www.usability.gov/how-to-and-tools/methods/heuristic-evaluation.html>.